V2319

Report Number TRC-96-N03

New Car Assessment Program (NCAP)

Frontal Barrier Impact Test

Audi AG

1996 Audi A4

4-door sedan

NHTSA Number: MT0503

TRC Test Number: 951101

Prepared By:

Transportation Research Center Inc.

10820 State Route 347

East Liberty, Ohio 43319

November 22, 1995

Final Report

Prepared For:

U. S. Department Of Transportation

National Highway Traffic Safety Administration

Office Of Market Incentives

Room No. 5313 (NRM-22)

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16. Abstract

A 56 kph (35 mph) frontal load cell barrier impact test was conducted on a 1996 Audi A4 4-door sedan, NHTSA No. MT0503, at Transportation Research Center Inc. on November 1, 1995. This test was conducted to obtain new car assessment and research data indicant of FMVSS 208, 212, 219 (partial), and 301 performance. The barrier impact velocity was 56.5 kph. The vehicle's maximum static crush was 591 millimeters. The ambient temperature was 21° C.

The driver's Head Injury Criteria (HIC) was 665. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 45.1 g. The driver's maximum chest deflection was 38 mm. The driver's left and right femur maximum axial forces were 5185 N and 4523 N, respectively.

The passenger's HIC was 432. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 42.0 g. The passenger's maximum chest deflection was 33 mm. The passenger's left and right femur maximum axial forces were 5378 N and 5052 N, respectively.

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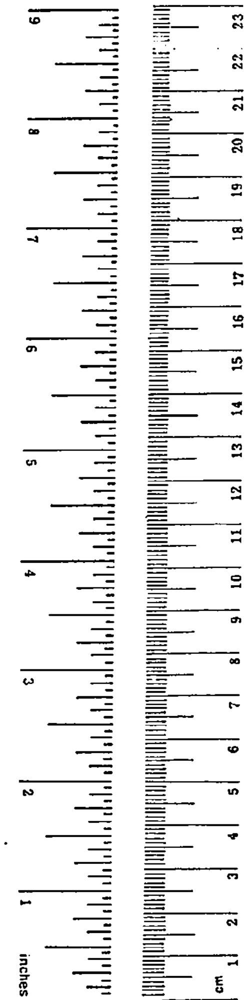
METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
in	inches	*2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
		AREA		
in^2	square inches	6.5	square centimeters	cm^2
ft^2	square feet	0.09	square meters	m^2
yd^2	square yards	0.8	square meters	m^2
mi^2	square miles	2.6	square kilometers	km^2
	acres	0.4	hectares	ha
		MASS (weight)		
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
		VOLUME		
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft^3	cubic feet	0.03	cubic meters	m^3
yd^3	cubic yards	0.76	cubic meters	m^3
		TEMPERATURE (exact)		
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

*1 in = 2.54 (exactly). For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weights and Measures, Price $2.25, SD Catalog No. C13.10:286.



Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
		AREA		
cm^2	square centimeters	0.16	square inches	in^2
m^2	square meters	1.2	square yards	yd^2
km^2	square kilometers	0.4	square miles	mi^2
ha	hectares (10,000 m^2)	2.5	acres	
		MASS (weight)		
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
		VOLUME		
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m^3	cubic meters	35	cubic feet	ft^3
m^3	cubic meters	1.3	cubic yards	yd^3
		TEMPERATURE (exact)		
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F

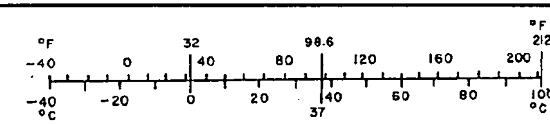


Table of Contents

List of Tables

List of Figures

List of Photographs

List of Photographs, Cont'd.

Section 1.0

Purpose and Test Procedure

Purpose

This 56 kph (35 mph) frontal barrier impact test is part of the New Car Assessment Program (NCAP) conducted for the National Highway Traffic Safety Administration's (NHTSA) Office of Market Incentives by Transportation Research Center Inc. (TRC) under Contract Number DTNH22-90-D-22121.

The purpose of this test was to obtain new car assessment and research data for vehicle crashworthiness and occupant restraint system performance for the subject vehicle, a 1996 Audi A4 4-door sedan, NHTSA Number MT0503, at an impact speed in excess of the current 48 kph (30 mph) FMVSS 208 requirements.

Test Procedure

This test was conducted in accordance with NHTSA's Laboratory Indicant Test Procedure, New Car Assessment Program, dated January 1, 1990. Data was obtained indicant of FMVSS 208, "Occupant Crash Protection"; FMVSS 212, "Windshield Retention"; FMVSS 219, "Windshield Zone Intrusion"; and FMVSS 301, "Fuel System Integrity," performance.

The test vehicle was instrumented with nine (9) accelerometers to measure longitudinal axis accelerations. The vehicle impacted a frontal load cell barrier instrumented with thirty-six (36) barrier face load cells. The vehicle's specified impact velocity range was 55.5 to 57.1 kph.

The test vehicle contained two (2) Part 572E 50th percentile adult male anthropomorphic test devices (dummies). The dummies were positioned in the front outboard designated seating positions according to the dummy placement procedures specified in Appendices VII and VIII of the Laboratory Indicant Test Procedure. This test was the third use of the driver dummy and the passenger dummy.

Both dummies were instrumented with primary and redundant head and chest accelerometers to measure longitudinal, lateral, and vertical accelerations, and with left and right femur load cells to measure axial forces. The dummies were also instrumented with neck moment and force load cells and chest deflection potentiometers, and foot accelerometers to measure longitudinal and vertical axis accelerations. In addition, the driver dummy's lower legs were instrumented with upper and lower tibia load cells to measure forces and moments.

The one-hundred-four (104) data channels were digitally sampled and recorded at 12,500 samples per second and processed per section IP11 of the Laboratory Indicant Test Procedure.

The crash event was recorded by one (1) real-time panning motion picture camera and sixteen (16) high-speed motion picture cameras. The pre- and post-test conditions were recorded by one (1) real-time motion picture camera.

The vehicle, occupant, and load cell barrier data are presented in Section 2.0. The occupant, camera, and vehicle measurements are presented in Section 3.0. Appendix A contains the still photographic prints. Appendix B contains the dummy, vehicle, and load cell barrier data plots. Appendix C contains the dummy certification data. Appendix D contains miscellaneous test information. Appendix E contains the restraint system instructions from the owner's manual.

Section 2.0

Frontal Barrier Impact Test Summary

Test Results Summary

This frontal load cell barrier test was conducted at TRC on November 1, 1995.

The test vehicle, a 1996 Audi A4 4-door sedan, NHTSA Number MT0503, was equipped with a 2.8-liter longitudinal engine, manual transmission, power steering, and power brakes. The vehicle's test weight was 1763.5 kg. The vehicle's impact speed was 56.5 kph. The vehicle sustained 591 mm of static crush during the impact.

The driver's Head Injury Criteria (HIC) was 665. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 45.1 g. The driver's maximum chest deflection was 38 mm. The driver's left and right femur maximum axial forces were 5185 N and 4523 N, respectively (See Data Acquisition Explanations).

The right front passenger's HIC was 432. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 42.0 g. The passenger's maximum chest deflection was 33 mm. The passenger's left and right femur maximum axial forces were 5378 N and 5052 N, respectively.

There was loss of windshield periphery retention along the entire lower edge (1454 mm), 169 mm up the right side from the lower right corner, and 318 mm up the left edge from the lower left corner.

There was no penetration through the windshield.

Following the impact, no fluid spilled from the vehicle's fuel system prior to the static rollover test or during any portion of the static rollover test.

Data Acquisition Explanations

The driver dummy's right femur force data channel, RFMF1, recorded questionable data spikes at approximately 36, 50, and 138 milliseconds.

The driver dummy's right foot Z-axis acceleration at heel data channel, FTRZH1, exceeded its full scale output at approximately 46 milliseconds.

The vehicle's engine top X-axis acceleration data channel, ENGXG1, stopped recording data after approximately 30 milliseconds because the device's cable was pinched then cut by vehicle crush.

The vehicle' engine bottom X-axis acceleration data channel, ENGXG2, stopped recording data after approximately 25 milliseconds because the device's cable was cut by vehicle crush.

Table 1 Crash Test Summary

NHTSA number:	MT0503	
Test type:	Frontal Load Cell Barrier	
Test date:	11/01/95	
Test time:	1625	
Ambient temperature:	21° C	
Vehicle year/make/ model/body style:	1996/Audi/A4/4-door sedan	
Vehicle test weight:	1763.5 kg	
Impact angle[1]:	0°	
Impact velocity[2]:	Primary = 56.5 kph Secondary = 56.5 kph	
Maximum static crush:	591 mm	
Average rebound:	529 mm	
Dummies:	Driver #142	Passenger #192
Type:	Part 572 E	Part 572 E
Location:	Left front	Right front
Restraint:	Airbag and 3-point unibelt	Airbag and 3-point unibelt
Number of data channels:	40	30
Number of cameras:	High-speed 16 Real-time 2	

[1] With respect to tow track centerline.
[2] Speed trap measurement (± .08 kph accuracy)

Table 2 Test Vehicle Information

Vehicle year/make/ model/body style:	1996/Audi/A4/4-door sedan
Color:	Blue
VIN:	WAUDA88D5TA000754
NHTSA number:	MT0503
Engine data:	
Placement:	Inline
Cylinders:	6
Displacement	2.8 liters
Transmission data:	_5_ speed, _X_ manual, __automatic, __overdrive
	_X_ FWD, _RWD, _4WD
Date vehicle received:	10/27/95
Odometer reading:	192
Dealer's name and address:	Capital Imported Cars, Inc. 301 North Hamilton Rd. Columbus, OH 43213

Accessories:

Power steering	Yes	Automatic transmission	No
Power brakes	Yes	Automatic speed control	Yes
Power seats	Yes	Tilting steering wheel	Yes
Power windows	Yes	Telescoping steering wheel	Yes
Tinted glass	Yes	Air conditioning	Yes
Radio	Yes	Anti-skid brake	Yes
Clock	Yes	Rear window defroster	Yes
Other	None		

Certification data from vehicle's label:

Vehicle manufactured by:	Audi AG
Date of manufacture:	06/95
VIN:	WAUDA88D5TA000754
GVWR:	4189 lbs.
GAWR: Front:	2359 lbs.
Rear:	2315 lbs.

Table 2 Test Vehicle Information, Cont'd.

Size of tires:	P205/65R16
Tire pressure with maximum capacity vehicle load:	
Front:	300 kPa
Rear:	300 kPa
Spare tire:	Temporary
Type of front seats:	Bucket

Tire & capacity data from vehicle's label:

Recommended tire size:	P205/55R16
Recommended cold tire pressure:	
Front:	220 kPa
Rear:	280 kPa
Designated seating capacity:	
Front	2
Rear	3
Total	5
Vehicle capacity weight:	550 kg

Test vehicle attitude:

Delivered attitude:	LF 693 mm;	RF 695 mm;	LR 693 mm;	RR 700 mm
Pre-test attitude:	LF 673 mm;	RF 675 mm;	LR 642 mm;	RR 638 mm
Post-test attitude:	LF 730 mm;	RF 770 mm;	LR 633 mm;	RR 652 mm

Table 2 Test Vehicle Information Cont'd

Weight of test vehicle as received (with maximum fluids):

Right front	446.0 kg	Right rear	254.0 kg
Left front	431.0 kg	Left rear	273.0 kg
Total front weight	877.0 kg	(62.5% of total vehicle weight)	
Total rear weight	527.0 kg	(37.5% of total vehicle weight)	
Total delivered weight	1404.0 kg		

Calculation of test vehicle's target test weight:

RCLW = Rated cargo and luggage weight

UDW = Unloaded delivered weight (1404 kg)

VCW[1] = Vehicle capacity weight (550 kg)

DSC = Designated seating capacity (5)

RCLW = VCW - 68 (DSC) = 550 - 68(5) = 210 kg

Target test weight = UDW + RCLW[1] + (Number of Hybrid III dummies x 76 kg/dummy)

Target test weight = 1404 + 210 + 152

Target test weight = 1766 kg

Weight of test vehicle with required dummies and 207.5 kg of cargo weight:

Right front	486.5 kg	Right rear	393.0 kg
Left front	481.5 kg	Left rear	402.5 kg
Total front weight	968.0 kg	(54.9% of total vehicle weight)	
Total rear weight	795.5 kg	(45.1% of total vehicle weight)	
Total test weight	1763.5 kg	(0.1% under target test weight)	

Weight of ballast secured in vehicle: 91 kg

Components removed to meet target test weight: None

CG rearward of front wheel centerline: 1182 mm

Vehicle wheelbase: 2620 mm

[1] From the vehicle's recommended tire pressure label.

<u>Table 3 Post-Impact Data</u>

Test number:	951101
NHTSA number:	MT0503
Test date:	11/01/95
Test time:	1625
Test type:	Frontal load cell barrier
Impact angle:	0°
Ambient temperature at impact area:	21° C
Temperature in occupant compartment:	21° C
Impact velocity:	
Primary	56.5 kph
Secondary	56.5 kph
Specified range	55.5 to 57.1 kph

Distance from vehicle to barrier:

Entering velocity trap	356 mm
Exiting velocity trap	51 mm

<u>Test vehicle static crush:</u>

Overall length of test vehicle:

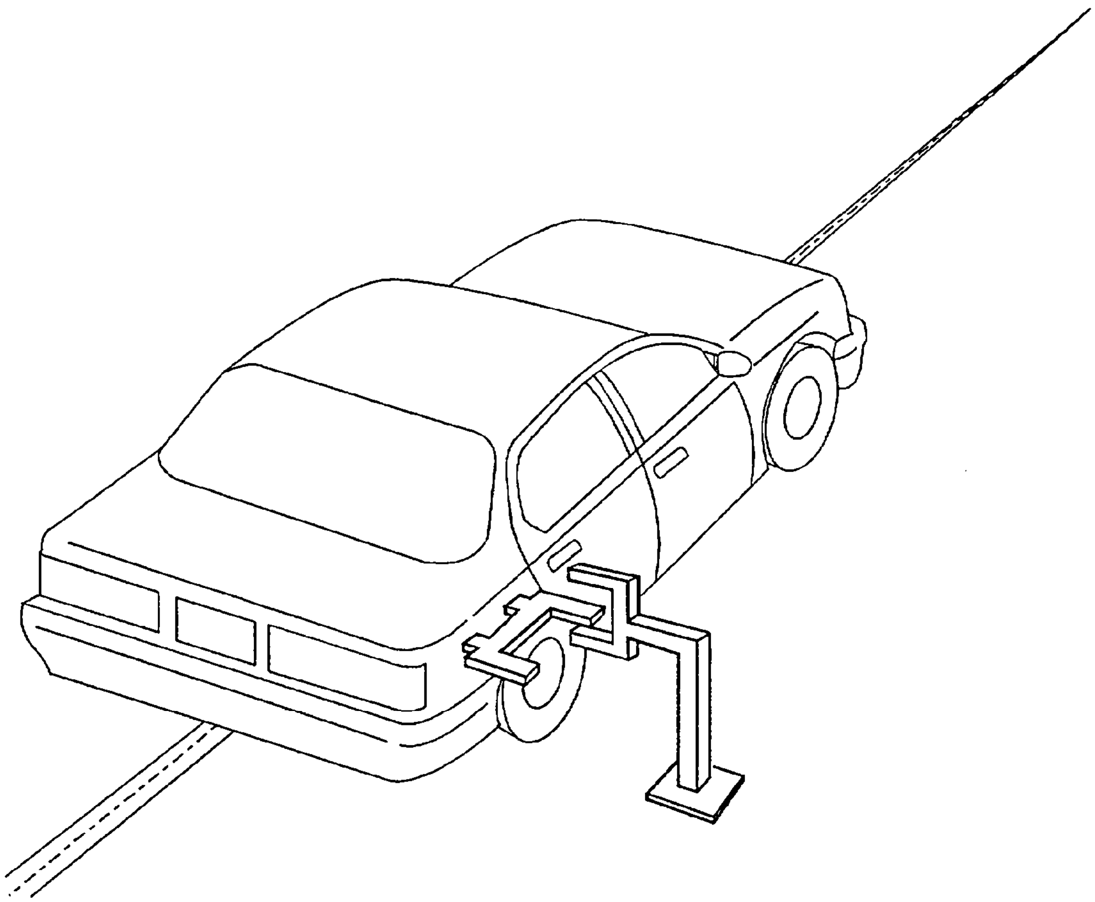
Pre-test:	L	4288 mm;	C	4522 mm;	R	4287 mm
Post-test:	L	3939 mm;	C	3931 mm;	R	3894 mm
Total crush:	L	349 mm;	C	591 mm;	R	393 mm
Average crush:	444 mm					

<u>Test vehicle rebound from flat barrier:</u>

Distance from test vehicle to barrier:

Post-test:	L	504 mm;	C	539 mm;	R	544 mm
Average rebound	529 mm					

Figure 1 Impact Velocity Measurement System

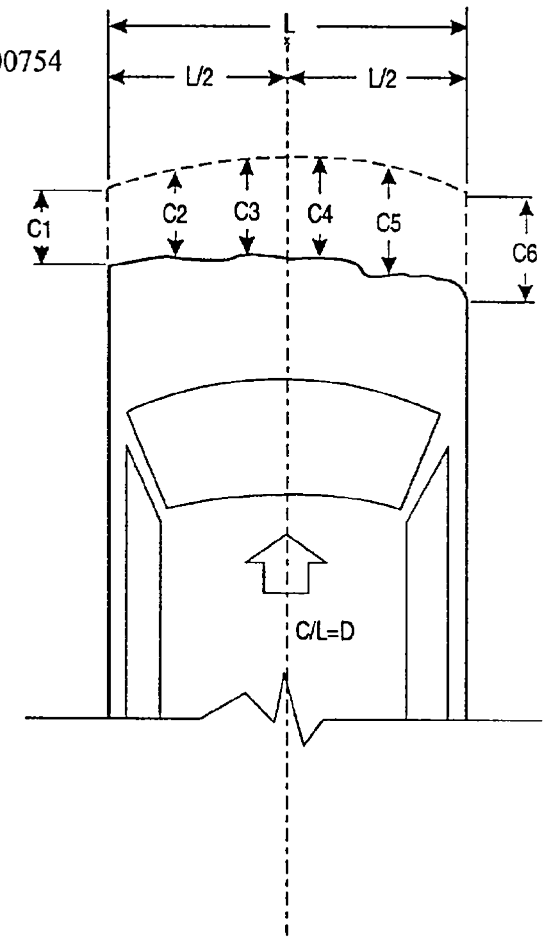


The final vane clears the final emitter/receiver pair 51 millimeters before impact.

The vanes have 305-millimeter spacing.

Figure 2 Accident Investigation Division Data
for 56 kph (35 mph) Frontal Barrier Impact

NHTSA number:	MT0503
Test date:	11/01/95
Vehicle year/make/ model/body style:	1996/Audi/A4/4-door sedan
Vehicle size category:	Compact
VIN:	WAUDA88D5TA000754
Build date:	06/95
Test weight:	1763.5 kg
Vehicle wheelbase:	2620 mm
Maximum width:	1733 mm
Front overhang:	914 mm



Collision Deformation Classification (CDC) code: 12FDEW3

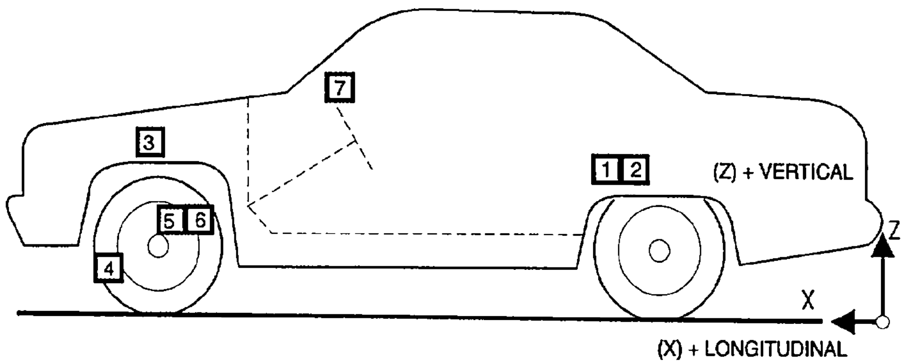
Crush depth measurements:

C1 = 349 mm
C2 = 459 mm
C3 = 546 mm
C4 = 538 mm
C5 = 490 mm
C6 = 393 mm

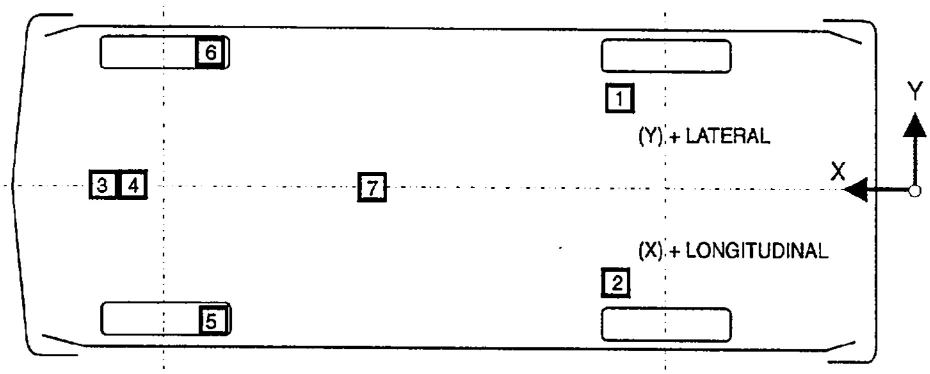
Midpoint of damage: D: Vehicle Longitudinal Centerline

Length of damaged region: L: 1524 mm

Figure 3 Vehicle Accelerometer Placement



SIDE VIEW



BOTTOM VIEW

Table 4 Vehicle Accelerometer Locations and Data Summary

TEST NUMBER: 951101 No. LOCATION	X	Y	Z	POSITIVE DIRECTION	NEGATIVE DIRECTION
1 LEFT REAR SEAT CROSSMEMBER	2777 mm	406 mm	433 mm		
LONGITUDINAL				3.7 g @ 136.7 ms	29.6 g @ 69.0 ms
REDUNDANT				3.7 g @ 137.4 ms	29.7 g @ 68.8 ms
2 RIGHT REAR SEAT CROSSMEMBER	2797 mm	-410 mm	435 mm		
LONGITUDINAL				5.6 g @ 123.0 ms	39.1 g @ 42.6 ms
REDUNDANT				5.0 g @ 123.0 ms	36.4 g @ 42.6 ms
3 ENGINE TOP	588 mm	-303 mm	732 mm		
LONGITUDINAL[1]				69.7 g @ 27.7 ms	201.8 g @ 19.5 ms
4 ENGINE BOTTOM	492 mm	25 mm	183 mm		
LONGITUDINAL[1]				116.3 g @ 26.0 ms	203.3 g @ 19.1 ms
5 RIGHT BRAKE CALIPER	1044 mm	-647 mm	290 mm		
LONGITUDINAL				64.8 g @ 59.4 ms	62.1 g @ 35.4 ms
6 LEFT BRAKE CALIPER	1043 mm	647 mm	301 mm		
LONGITUDINAL				44.9 g @ 59.4 ms	68.7 g @ 40.2 ms
7 INSTRUMENT PANEL CENTER	1402 mm	0 mm	949 mm		
LONGITUDINAL				48.2 g @ 72.2 ms	97.4 g @ 42.4 ms

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN MILLIMETERS. X-AXIS LOCATIONS ARE MEASURED REARWARD FROM THE FRONT BUMPER.

REFERENCE: X: + FORWARD ACCELERATION
Y: + LEFT FROM VEHICLE CENTERLINE
Z: + UP FROM GROUND LEVEL

[1]See DATA ACQUISITION EXPLANATIONS

Table 5 Post-Impact Dummy/Vehicle Data

Visible Dummy Contact Points:

	Driver #142	Passenger #192
Head	Airbag	Airbag
Chest	Airbag	Airbag
Abdomen	None	None
Left knee	Instrument panel	Instrument panel
Right knee	Instrument panel	Instrument panel

Door Opening:

	Left	Right
Front	Easy	Easy
Rear	Easy	Easy

Seat Movement:

	Seat Back Failure	Seat Shift
Front	None	None
Rear	NA	NA

Glazing Damage: The entire windshield was cracked and its lower edge was separated from the frame.

Other Notable Impact Effects: None

Table 6 FMVSS 208 Data Summary

Vehicle year/make/ model/body style:	1996/Audi/A4/4-door sedan
Vehicle NHTSA number:	MT0503
Test date:	11/01/95

	Driver Dummy #142		Passenger Dummy #192	
Maximum Accelerations:				
Head X-axis	-66.7	g	-46.2	g
Head Y-axis	8.6	g	4.4	g
Head Z-axis	-24.0	g	-31.7	g
Head resultant	67.1	g	52.2	g
Chest X-axis	-45.8	g	-42.6	g
Chest Y-axis	-7.3	g	8.2	g
Chest Z-axis	-13.8	g	17.4	g
Chest resultant[1]	45.1	g	42.0	g
Chest resultant time interval[1]	.003	sec	.003	sec
Head Injury Criteria (HIC) Values:				
HIC[2]	665		432	
HIC starting time	.055	sec	.059	sec
HIC ending time	.085	sec	.095	sec
Avg. head resultant accel. during HIC time interval	54.3	g	42.8	g
Maximum Chest Deflections:				
Chest X-axis	-38	mm	-33	mm
Maximum chest deflection time	.066	sec	.064	sec
Maximum Compressive Femur Forces:				
Left femur	5185	N	5378	N
Right femur[3]	4523	N	5052	N
Maximum Seat Belt Forces:				
Lap belt	5716	N	5061	N
Shoulder belt	7020	N	7629	N

Note: All values listed must be occurring during primary impact event. (Head accelerations listed must be during HIC time interval.)

1 0.003 Sec. Minimum duration.
2 The maximum HIC time interval is 36 milliseconds.
3 See Data Acquisition Explanations

Table 7 Hybrid III Data Summary

Vehicle year/make/
model/body style: 1996/Audi/A4/4-door sedan

Vehicle NHTSA number: MT0503

Test date: 11/01/95

	Driver Dummy #142	Passenger Dummy #192
Maximum Forces		
Neck X-axis shear force	-416 N	449 N
Neck Y-axis shear force	-229 N	-215 N
Neck Z-axis axial force[1]	1807 N	1470 N
Maximum Moments		
Neck moment about X-axis	22.2 N·m	-16.5 N·m
Neck moment about Y-axis	29.7 N·m	36.8 N·m
Neck moment about Z-axis	15.0 N·m	-8.6 N·m
Maximum Accelerations:		
Pelvis X-axis	-80.3 g	-87.9 g
Pelvis Y-axis	15.3 g	11.8 g
Pelvis Z-axis	27.1 g	20.3 g
Pelvis resultant	80.9 g	87.9 g

Note: All values listed must be occurring during primary impact event.

Table 7 Hybrid III Data Summary, Cont'd.

Vehicle year/make/ model/body style:	1996/Audi/A4/4-door sedan
Vehicle NHTSA number:	MT0503
Test date:	11/01/95

	Driver Dummy #142	Passenger Dummy #192
Left upper tibia moment about X-axis	50.0 N·m	NA
Left upper tibia moment about Y-axis	75.9 N·m	NA
Right upper tibia moment about X-axis	-87.1 N·m	NA
Right upper tibia moment about Y-axis	221.6 N·m	NA
Left lower tibia X-axis force	-686 N	NA
Left lower tibia Z-axis force	859 N	NA
Left lower tibia moment about Y-axis	-115.1 N·m	NA
Right lower tibia X-axis force	-1842 N	NA
Right lower tibia Z-axis force	-7925 N	NA
Right lower tibia moment about Y-axis	-263.5 N·m	NA
Left foot X-axis acceleration	70.7 g	-92.1 g
Left foot Z-axis acceleration at heel	49.0 g	87.0 g
Left foot Z-axis acceleration at toe	-87.7 g	109.7 g
Right foot X-axis acceleration	-180.4 g	98.7 g
Right foot Z-axis acceleration at heel[1]	-401.8 g	99.4 g
Right foot Z-axis acceleration at toe	-312.0 g	-160.6 g

Note: All values listed must be occurring during primary impact event

[1] See data acquisition explanations.

Dummy Kinematic Summary

Driver Dummy

Upon impact, the driver dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's head and chest impacted the airbag. The dummy was restrained by the airbag and three-point unibelt. The dummy rebounded rearward into the seat back with the dummy's head rotating rearward contacting the head restraint. The driver dummy came to rest seated in the driver's seat, restrained by the three-point unibelt.

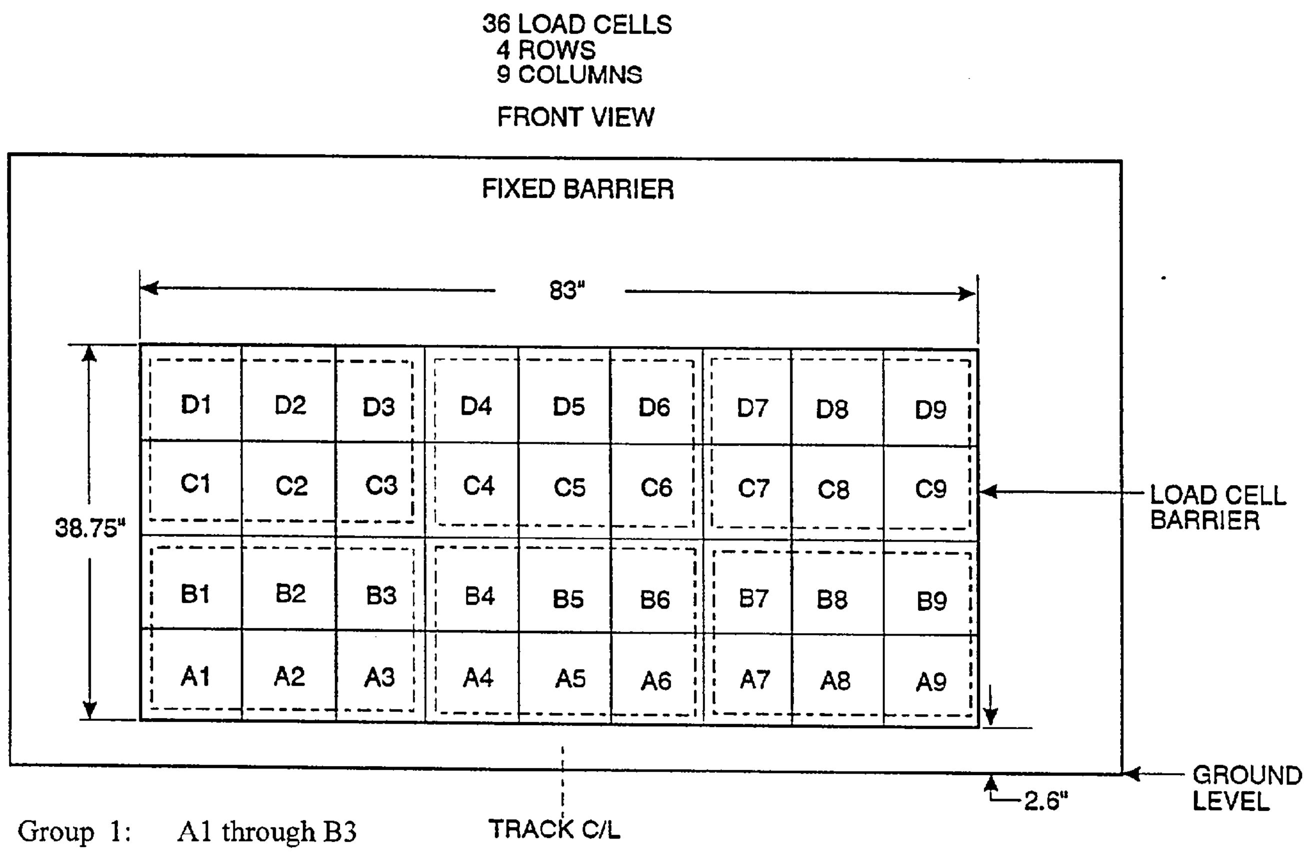
Right Front Passenger Dummy

Upon impact, the right front passenger dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's head and chest impacted the airbag as the dummy's head rotated forward. The dummy was restrained by the passenger's airbag and the three-point unibelt. The dummy rebounded rearward into the right portion of the seat back as the dummy's head rotated rearward contacting the right portion of the head restraint. The right front passenger dummy came to rest in the right front passenger's seat restrained by the three-point unibelt, leaning to the right.

Table 8 Seat Belt Performance Assessment Test Data

	Driver	Passenger
Belt length data:		
Belt length from trim panel exit to bolt hole anchor point for continuous webbing systems.	2405 mm	2405 mm
Shoulder belt length as measured on Part 572 dummy.	955 mm	970 mm
Lap belt length as measured on Part 572 dummy.	731 mm	747 mm
Shoulder belt spool-off length:		
As determined by film analysis	56 mm	51 mm
As determined mechanically	NA	NA
As determined electronically	NA	NA
Belt stretch length:		
As measured mechanically	NA	NA
As measured electronically	NA	NA
Retractor lock-up time:		
As determined by shoulder belt spool-off	64 ms	60 ms

Figure 4 Load Cell Barrier Configuration



Group 1: A1 through B3
Group 2: A4 through B6
Group 3: A7 through B9
Group 4: C1 through D3
Group 5: C4 through D6
Group 6: C7 through D9

Table 9 Load Cell Barrier Data Summary

Location	Positive direction					Negative direction				
Total group 1	2.5	kN	@	3.5	ms	56.3	kN	@	20.6	ms
Total group 2	3.1	kN	@	2.2	ms	499.7	kN	@	19.4	ms
Total group 3	2.7	kN	@	3.0	ms	103.6	kN	@	30.8	ms
Total group 4	0.5	kN	@	2.6	ms	21.6	kN	@	35.8	ms
Total group 5	1.3	kN	@	2.2	ms	75.5	kN	@	19.7	ms
Total group 6	0.2	kN	@	2.0	ms	17.7	kN	@	30.5	ms
Total load cell force	2.9	kN	@	2.2	ms	742.0	kN	@	19.7	ms

Tension is positive
Compression is negative

Section 3.0

FMVSS 212, 219 (partial), and 301 Data

Figure 5 FMVSS 212 Test Data

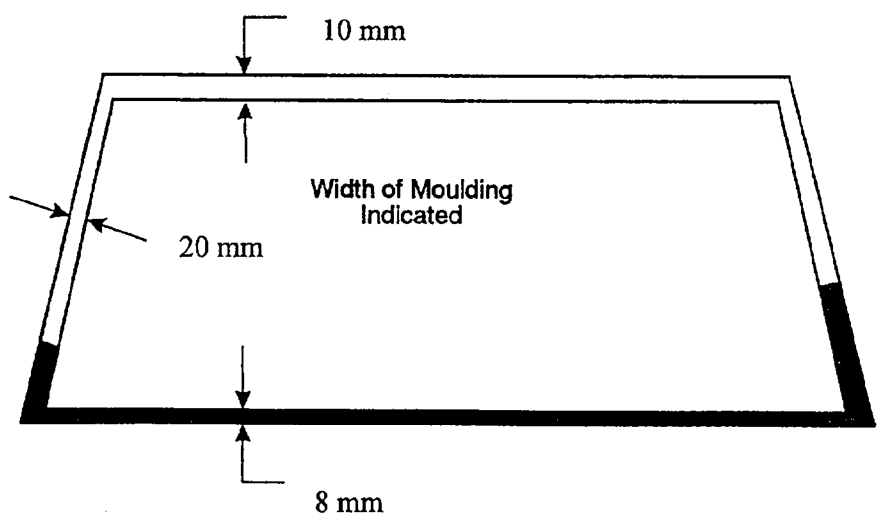
Details of windshield mounting such as retention method, trim type, etc.:
Plastic trim around outer perimeter, adhesive around inner perimeter.

FMVSS 212 requirements: The post-test periphery retention amount must be at least 75% of the pre-test periphery measurement for vehicles NOT equipped with automatic restraints, and 50% for each side of windshield for vehicles equipped with automatic restraint systems for front occupants.

Windshield periphery measurements:

	Pre-test	Post-test	Percent retention
Right side	2035 mm	1139 mm	56.0
Left side	2035 mm	990 mm	48.6
Total	4070 mm	2129 mm	52.3

Pre-test windshield mounting material temperature: 21° C



Front view of windshield[1]

Loss of windshield retention lengths:
Retention was lost across the entire lower edge of the windshield (1454 mm). Retention was also lost 169 mm up from the lower right corner and 318 mm up from the lower left corner.

[1] Indicate areas of loss of retention, if any, on windshield diagram.

Figure 6 FMVSS 219 Test Data

Protected zone lower edge requirement:

The lower edge of the protected zone is determined by placing a 165-millimeter diameter rigid sphere weighing 6.8 kg in a position such that it simultaneously contacts the inner surface of the windshield and the top surface of the instrument panel including padding. Draw the locus of points on the inner surface of the windshield contactable by the sphere across the width of the instrument panel. From the outermost contactable points, extend the locus line horizontally to the edges of the windshield, and then draw a line on the inner surface of the windshield below and 13 millimeters from the locus line. The **lower edge of the protected zone** is the longitudinal projection onto the outer surface of the windshield of this line.

Windshield measurements:

A = 1114 mm

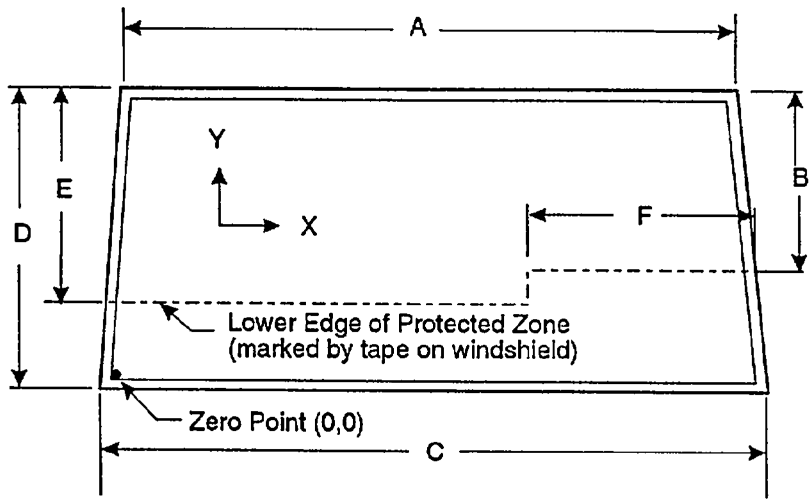
B = 430 mm

C = 1520 mm

D = 790 mm

E = 465 mm

F = 510 mm



FRONT VIEW

Method of adhering protected zone template to windshield: NA

Areas of windshield template penetration greater than 6 mm: NA

	Coordinates X Y
1.	
2.	
3.	

Areas of windshield penetration, below the protected zone, through the inner surface of the windshield: None

1.	
2.	
3.	

Table 10 Fuel System Data

Vehicle year/make/ model/body style:	1996/Audi/A4/4-door sedan
NHTSA number:	MT0503
Fuel system capacity:	62.0 liters (from owner's manual)
Usable capacity:	62.0 liters (furnished by COTR)
Test volume range:	57.0 liters to 58.3 liters (92-94% of usable)
Actual test volume:	57.7 liters (with entire fuel system filled)
Test fluid type:	Stoddard solvent
Specific gravity:	0.764
Kinematic viscosity:	0.99 centistoke
Test fluid color:	Purple
Did electric fuel pump operate with ignition switch "on" and the engine not operating.	No
Details of fuel system:	The fuel filler cap is located on the right rear quarter panel. The filler neck enters the top of the fuel tank's right rear corner. Fuel lines run along the right side of the vehicle's underbody to the engine compartment.

Table 11 FMVSS 301 Post-Impact Test Data

NHTSA number: MT0503

Test date: 11/01/95

Vehicle year/make/
model/body style: 1996/Audi/A4/4-door sedan

Test requirements:

Test vehicle fuel tank filled to 92 to 94% of manufacturer's usable capacity and with electric fuel pump operating (if it will operate without engine operation). Part 572 test dummies located at each front designated seating position.

Test vehicle impact type:

_x_ Frontal (_56_ kph)

___ Oblique (48 kph) with __° barrier face first contacting ___ (driver/pass.) side

___ Rear moving barrier (48 kph)

___ Lateral moving barrier (32 kph)

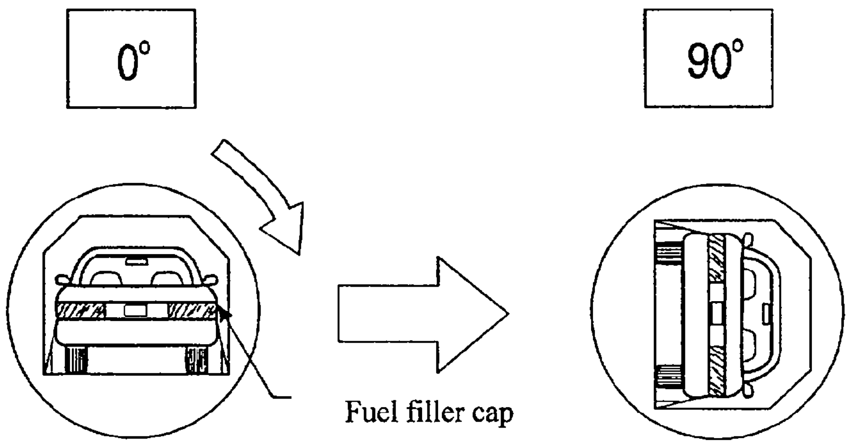
Fuel system fluid spillage measurements:

	Test Results	Maximum Allowable
1. From impact until vehicle motion ceases	0 g	28 g
2. 5-minute period after vehicle motion ceases	0 g	142 g
3. Next 25 minutes after 5-minute period	0 g	28 g/min

Fuel system fluid spillage location(s): None

Figure 7 FMVSS 301 Static Rollover Test Data

NHTSA number: MT0503
Test phase



Static rollover machine rotation time information: (specified range is 1-3 minutes)

Time required for machine to rotate 90°	=	2	minutes,	0	seconds
FMVSS 301 position hold time	=	5	minutes,	0	seconds
Total	=	7	minutes,	0	seconds
Next whole minute interval	=	7	minutes		

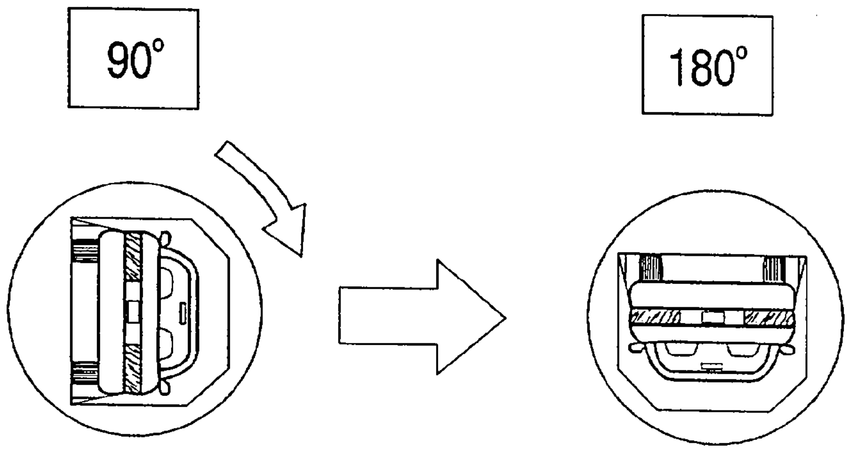
Fuel system fluid spillage measurements:

0° to 90° rotation (fuel filler cap down)	Test Results	Maximum Allowable
1. First five minutes from onset of rotation	0 g	142 g
2. Sixth minute from onset of rotation	0 g	28 g
3. Seventh minute from onset of rotation	0 g	28 g

Fuel system fluid spillage location(s): None

Figure 7 FMVSS 301 Static Rollover Test Data, Cont'd.

Test phase



Static rollover machine rotation time information: (specified range is 1-3 minutes)

Time required for machine to rotate 90°	= 2	minutes,	0 seconds
FMVSS 301 position hold time	= 5	minutes,	0 seconds
Total	= 7	minutes,	0 seconds
Next whole minute interval	= 14	minutes	

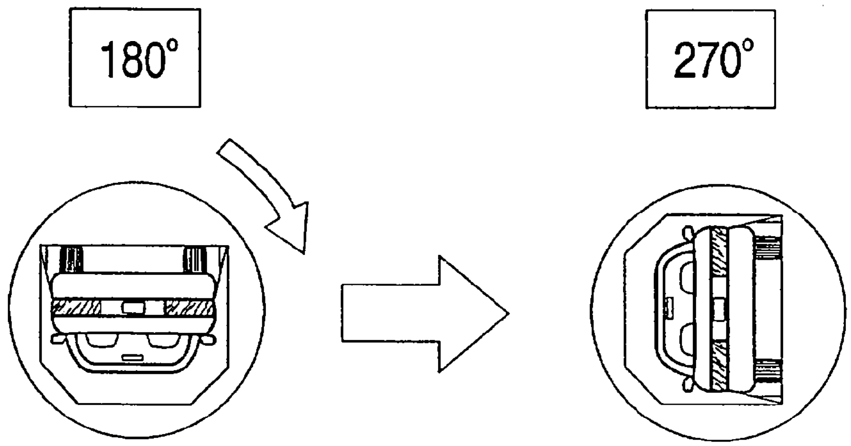
Fuel system fluid spillage measurements:

90° to 180° rotation	Test Results	Maximum Allowable
1. First five minutes from onset of rotation	0 g	142 g
2. Sixth minute from onset of rotation	0 g	28 g
3. Seventh minute from onset of rotation	0 g	28 g

Fuel system fluid spillage location(s): None

Figure 7 FMVSS 301 Static Rollover Test Data, Cont'd.

Test phase



Static rollover machine rotation time information: (specified range is 1-3 minutes)

Time required for machine to rotate 90°	=	2	minutes,	0	seconds
FMVSS 301 position hold time	=	5	minutes,	0	seconds
Total	=	7	minutes,	0	seconds
Next whole minute interval	=	21	minutes		

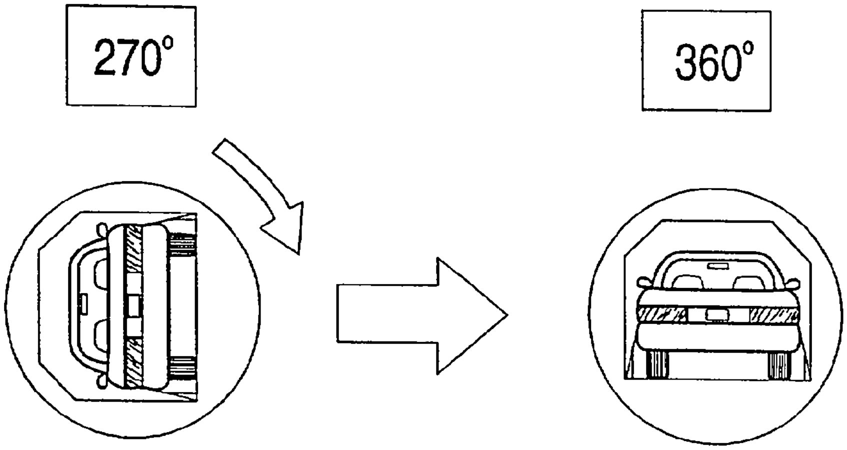
Fuel system fluid spillage measurements:

180° to 270° rotation		Test Results	Maximum Allowable
1.	First five minutes from onset of rotation	0 g	142 g
2.	Sixth minute from onset of rotation	0 g	28 g
3.	Seventh minute from onset of rotation	0 g	28 g

Fuel system fluid spillage location(s): None

Figure 7 FMVSS 301 Static Rollover Test Data, Cont'd.

Test phase



Static rollover machine rotation time information: (specified range is 1-3 minutes)

Time required for machine to rotate 90°	=	2	minutes,	0	seconds
FMVSS 301 position hold time	=	5	minutes,	0	seconds
Total	=	7	minutes,	0	seconds
Next whole minute interval	=	28	minutes		

Fuel system fluid spillage measurements:

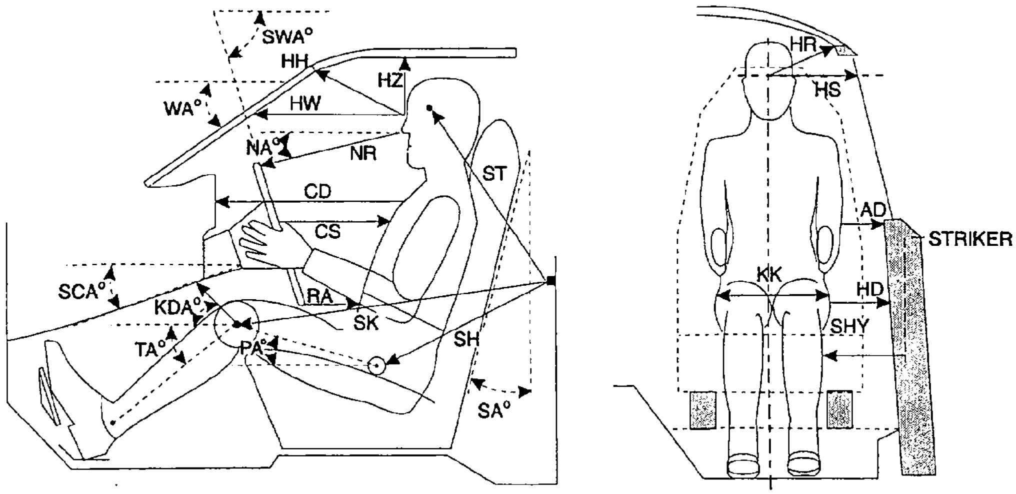
270° to 360° rotation	Test Results	Maximum Allowable
1. First five minutes from onset of rotation	0 g	142 g
2. Sixth minute from onset of rotation	0 g	28 g
3. Seventh minute from onset of rotation	0 g	28 g

Fuel system fluid spillage location(s): None

Section 4.0

Occupant, Camera, and Vehicle Information

Figure 8 Dummy Measurement Locations for Front Seat Occupants



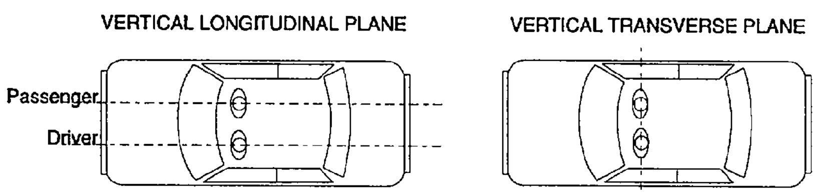


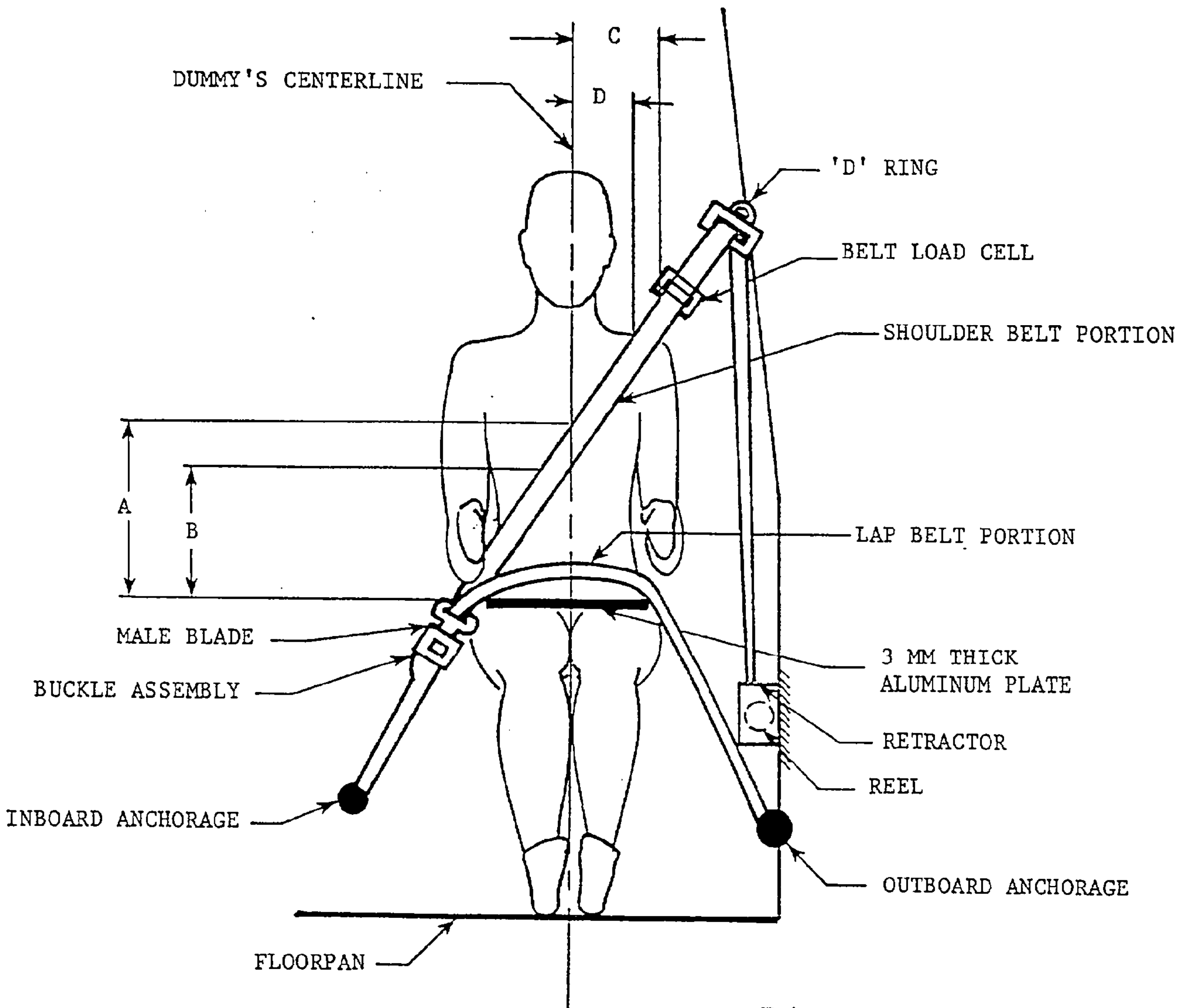
Table 12 Dummy Measurement Data For Front Seat Occupants

Designation	Type of Measurement	Driver (Serial #142)	Passenger (Serial #192)
WA	Windshield angle	26°	NA
SWA	Steering wheel angle	70°	NA
SCA	Steering column angle	20°	NA
SA	Seat back angle	15°	15°
HZ	Head to roof	187 mm	183 mm
HH	Head to header	351 mm	337 mm
HW	Head to windshield	599 mm	595 mm
HR	Head to side header	203 mm	210 mm
NR	Nose to rim	397 mm	NA
NA	Nose to rim angle	8°	NA
CD	Chest to dash	543 mm	548 mm
CS	Steering wheel to chest	331 mm	NA
RA	Rim to abdomen	232 mm	NA
KDL	Left knee to dash	204 mm	193 mm
KDR	Right knee to dash	215 mm	195 mm
KDA	Outboard knee to dash angle	32°	31°
PA	Pelvic angle	24°	22°
TA	Tibial angle	35°	33°
KK	Knee to knee	352 mm	269 mm
ST[1]	Striker to head	435 mm	439 mm
	Striker to head angle	-84°	-79°
SK[1]	Striker to knee	604 mm	605 mm
	Striker to knee angle	11°	10°
SH[1]	Striker to H-point	309 mm	309 mm
	Striker to H-point angle	54°	51°
SHY	Striker to H-point (Y dir.)	256 mm	268 mm
HS	Head to side window	285 mm	281 mm
HD	H-point to door	153 mm	158 mm
AD	Arm to door	102 mm	117 mm

The seat back angle (SA°) is measured relative to vertical, all other angles are measured relative to horizontal.

[1] A negative angle indicates the measurement point was above the striker.

Figure 9 Seat Belt Positioning Data



	Driver	Passenger
A - Top surface of aluminum plate to belt upper edge	350 mm	366 mm
B - Top surface of aluminum plate to belt lower edge	274 mm	281 mm
C - Dummy centerline to outer edge of belt at chest flesh top	98 mm	95 mm
D - Dummy centerline to inner edge of belt at chest flesh top	42 mm	38 mm
Lap belt tension	13 N	18 N
Shoulder belt tension	13 N	13 N
Position of adjustable belt anchorage	3rd of 5	3rd of 5

Figure 10 Camera Positions

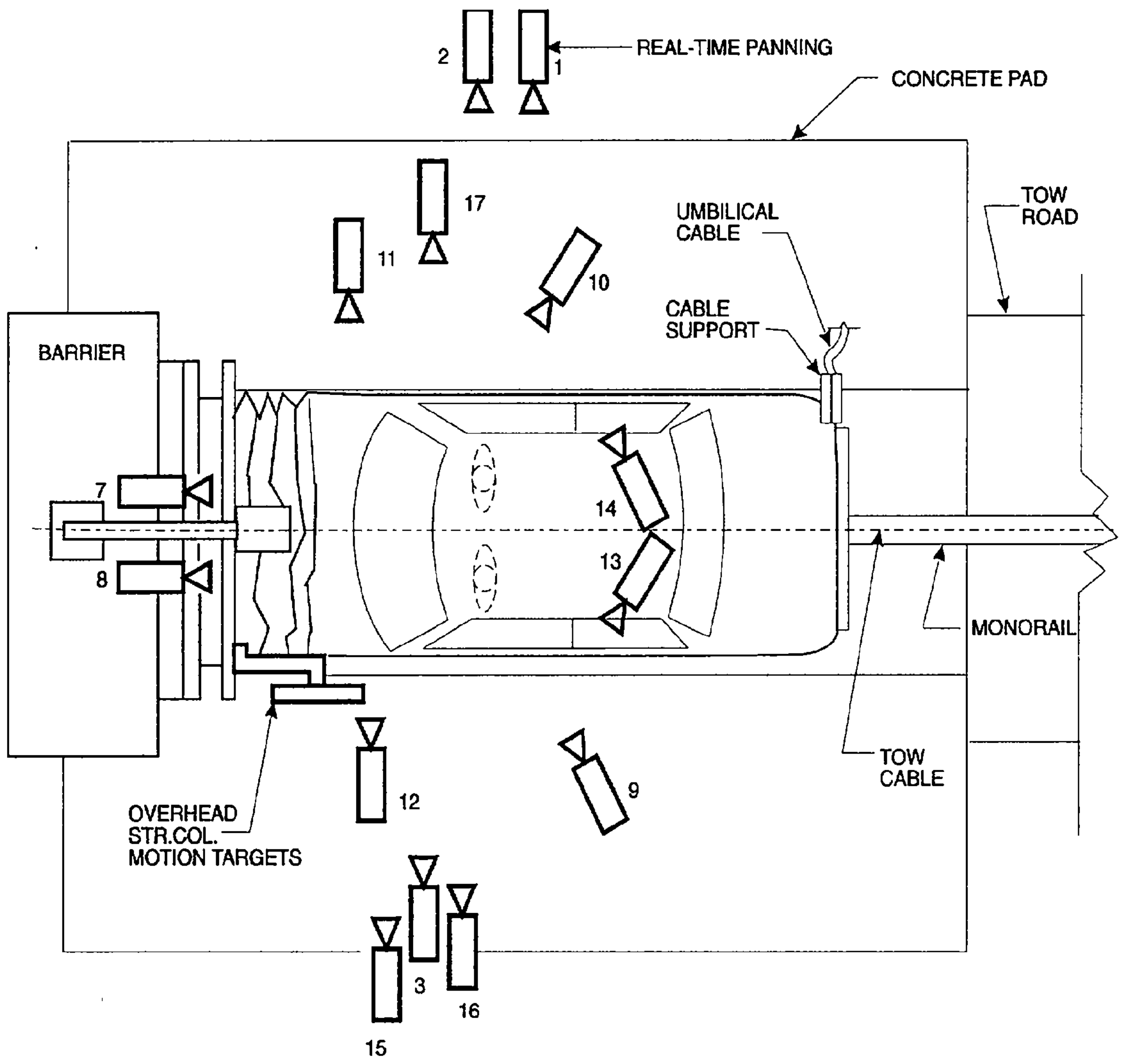


Figure 10 Camera Positions, Cont'd.

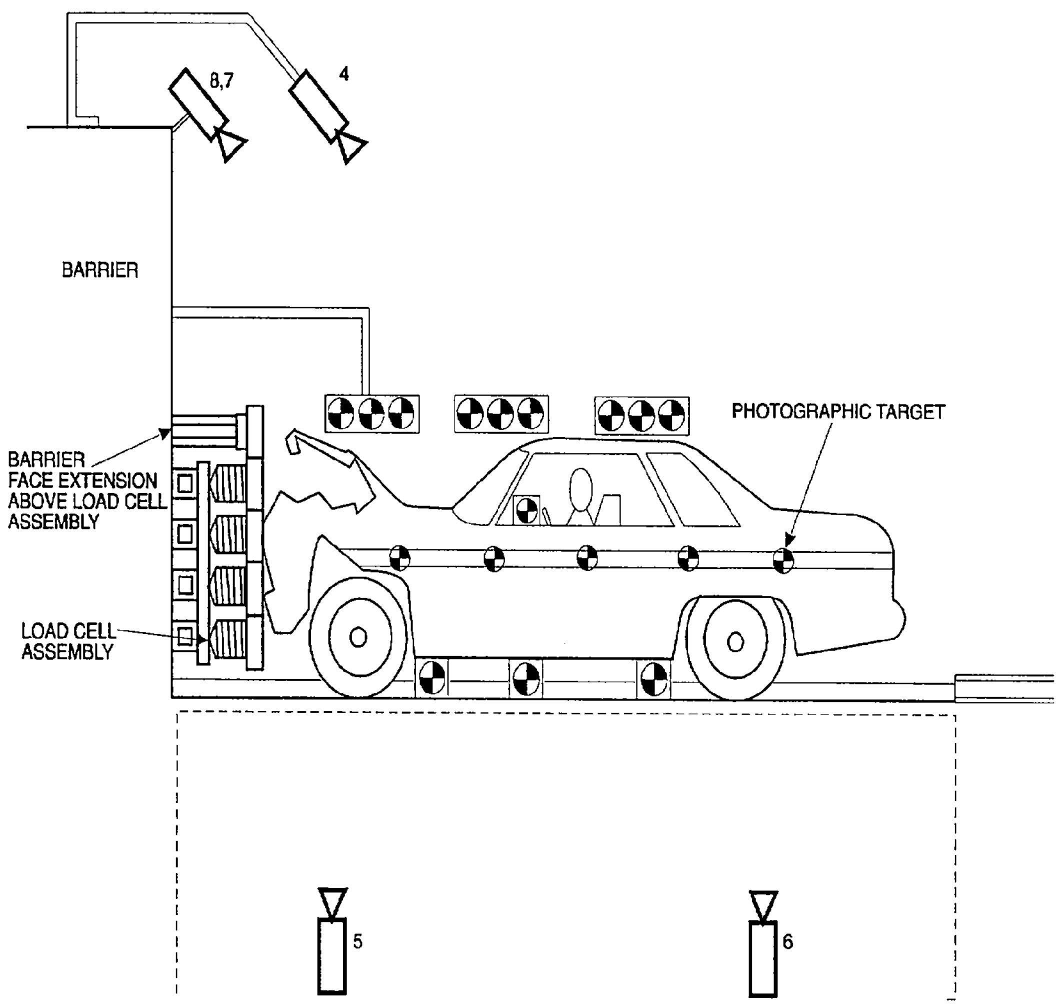


Table 13 Motion Picture Camera Locations

Test Number: 951101

Vehicle year/make/model/body style: 1996/Audi/A4/4-door sedan

Camera Number	View	Camera Positions[1] X	Camera Positions[1] Y	Camera Positions[1] Z	Angle[2]	Film Plane to Head Target	Lens	Film Speed
1	Real-time panning	-3607 mm	-2802 mm	1549 mm	NA	NA mm	16 mm	24 frames/s
2	Vehicle crush	-2065 mm	-6767 mm	942 mm	-2°	NA mm	13 mm	502 frames/s
3	Dummy kinematics	-1054 mm	7493 mm	1118 mm	-12°	5994 mm	25 mm	992 frames/s
4	Windshield damage	-925 mm	0 mm	2489 mm	-40°	NA mm	13 mm	515 frames/s
5	Crush & fluid spillage	-1283 mm	0 mm	-2347 mm	90°	NA mm	13 mm	1000 frames/s
6	Fluid spillage	-2522 mm	0 mm	-2515 mm	90°	NA mm	13 mm	995 frames/s
7	Passenger kinematics	-114 mm	-351 mm	2159 mm	-40°	NA mm	17 mm	495 frames/s
8	Driver kinematics	-173 mm	368 mm	2159 mm	-41°	NA mm	17 mm	505 frames/s
9	Driver kinematics	-4572 mm	1854 mm	2591 mm	-27°	2210 mm	25 mm	480 frames/s
10	Passenger kinematics	-4674 mm	-1880 mm	2540 mm	-26°	2134 mm	25 mm	488 frames/s
11	Windshield intrusion	-968 mm	-7775 mm	1118 mm	0°	NA mm	50 mm	512 frames/s
12	Windshield intrusion	-1346 mm	7859 mm	1074 mm	0°	NA mm	50 mm	502 frames/s
13	Driver seat belt movement	-2032 mm	NA	NA	NA	NA mm	NA mm	500 frames/s
14	Passenger seat belt movement	-2032 mm	NA	NA	NA	NA mm	NA mm	498 frames/s
15	Column movement	-1829 mm	7264 mm	2616 mm	-14°	NA mm	25 mm	500 frames/s
16	Column movement	-1829 mm	7264 mm	1908 mm	-9°	NA mm	25 mm	502 frames/s
17	Passenger kinematics	-986 mm	-5354 mm	1151 mm	7°	5867 mm	25 mm	1000 frames/s

[1] +X = Film plane forward of barrier face
+Y = Film plane to left of monorail centerline
+Z = Film plane above ground level
[2] +Angle = Film plane angled upward from horizontal plane

Figure 11 Vehicle Target Locations

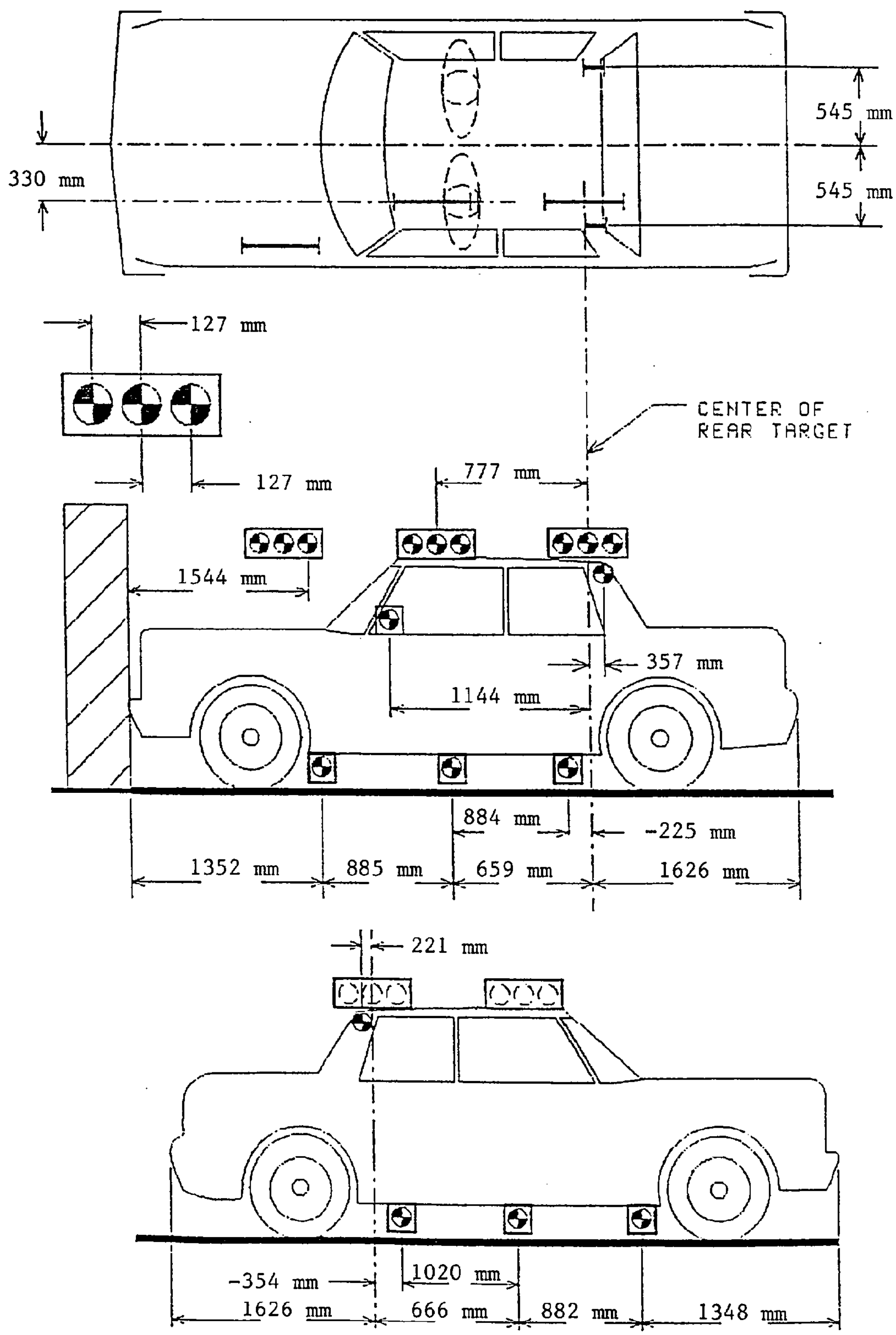
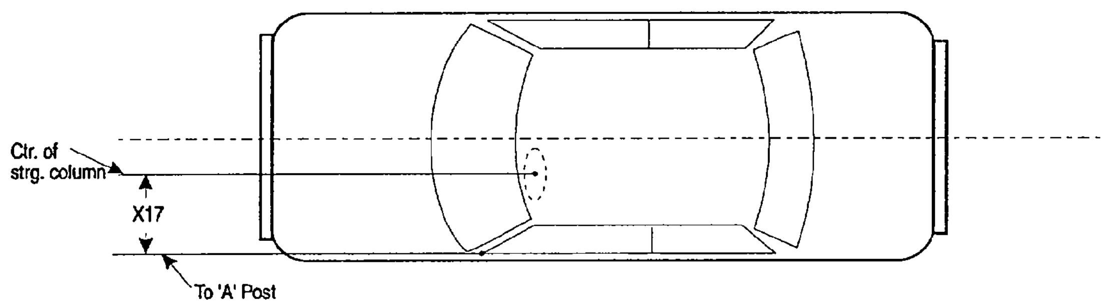
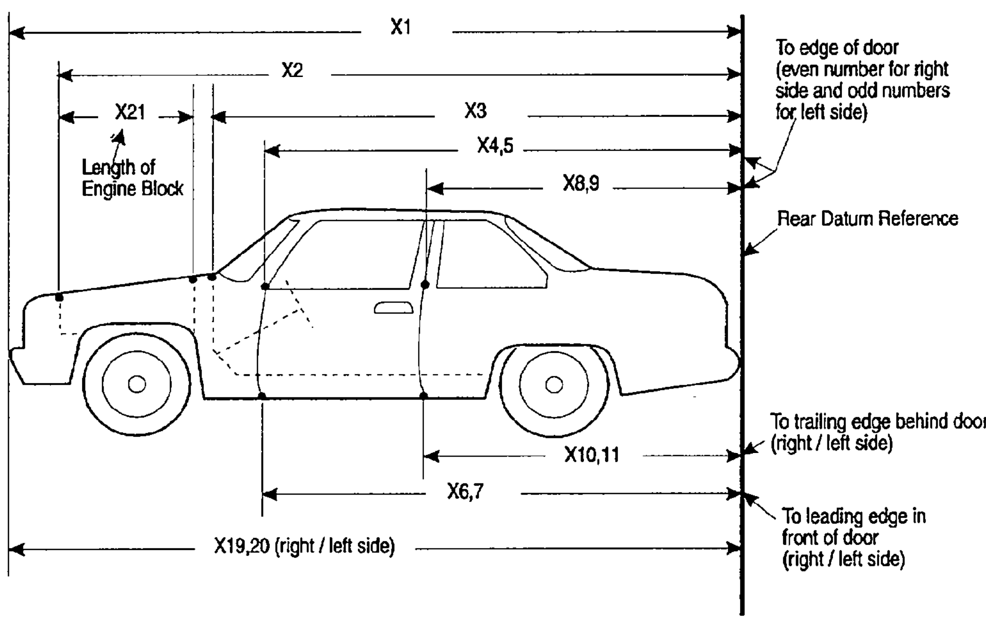


Figure 12 Pre-Test And Post-Test Measurement Points





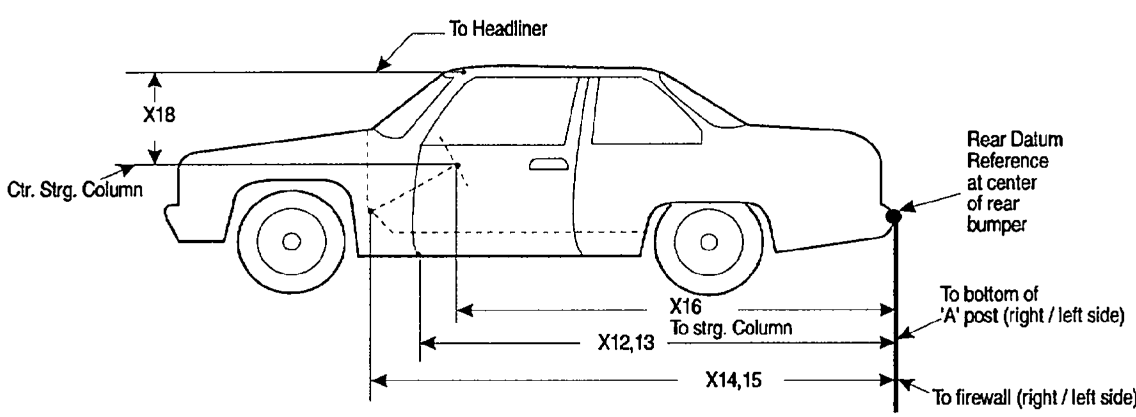


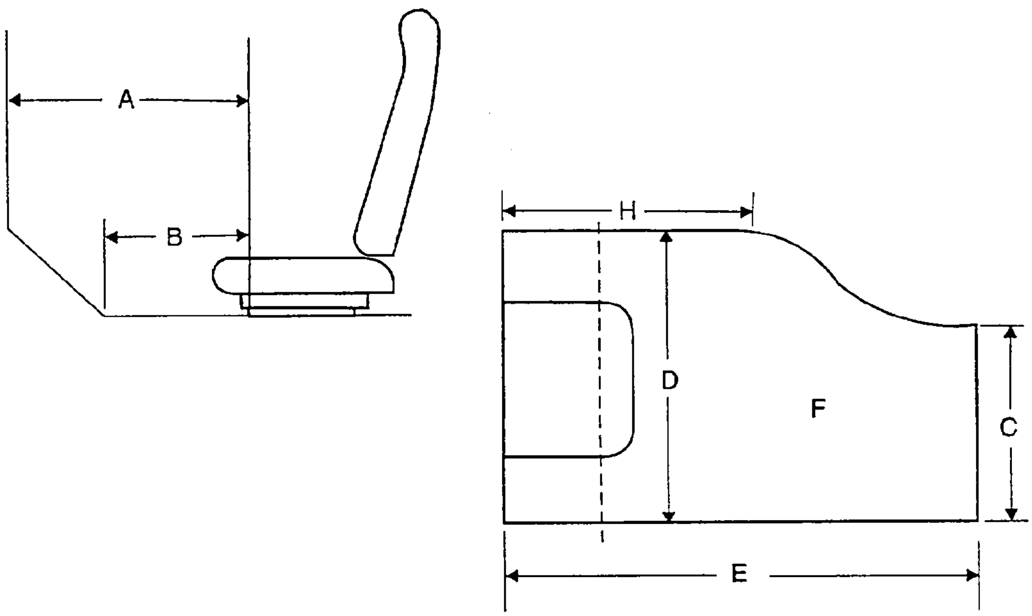
Table 14 Impacted Vehicle Measurements

Vehicle Make/Model: Audi/A4 Test Number: 951101

No.	Type of measurement	Pre-test	Post-test	Diff.
X1	Total length of vehicle at centerline	4522 mm	3931 mm	591 mm
X2	Rear surface of vehicle to front of engine block	4165 mm	3771 mm	394 mm
X3	Rear surface of vehicle to firewall	3600 mm	3331 mm	269 mm
X4	Rear surface of vehicle to upper leading edge of right door	3105 mm	3109 mm	-4 mm
X5	Rear surface of vehicle to upper leading edge of left door	3105 mm	3114 mm	-9 mm
X6	Rear surface of vehicle to lower leading edge of right door	3110 mm	3103 mm	7 mm
X7	Rear surface of vehicle to lower leading edge of left door	3115 mm	3104 mm	11 mm
X8	Rear surface of vehicle to upper trailing edge of right door	2055 mm	2052 mm	3 mm
X9	Rear surface of vehicle to upper trailing edge of left door	2050 mm	2058 mm	-8 mm
X10	Rear surface of vehicle to lower trailing edge of right door	2074 mm	2059 mm	15 mm
X11	Rear surface of vehicle to lower trailing edge of left door	2074 mm	2059 mm	15 mm
X12	Rear surface of vehicle to bottom of "A" post on right side	3054 mm	3047 mm	7 mm
X13	Rear surface of vehicle to bottom of "A" post on left side	3053 mm	3042 mm	11 mm
X14	Rear surface of vehicle to firewall - right side	3622 mm	3362 mm	260 mm
X15	Rear surface of vehicle to firewall - left side	3639 mm	3407 mm	232 mm
X16	Rear surface of vehicle to steering wheel center	2645 mm	2612 mm	33 mm
X17	Center of steering column to "A" post	265 mm	214 mm	51 mm
X18	Center of steering column to headliner	415 mm	381 mm	34 mm
X19	Rear surface of vehicle to right side of front bumper	4287 mm	3894 mm	393 mm
X20	Rear surface of vehicle to left side of front bumper	4288 mm	3939 mm	349 mm
X21	Length of engine block	500 mm	500 mm	0 mm

Figure 13 Static Footwell Deformation

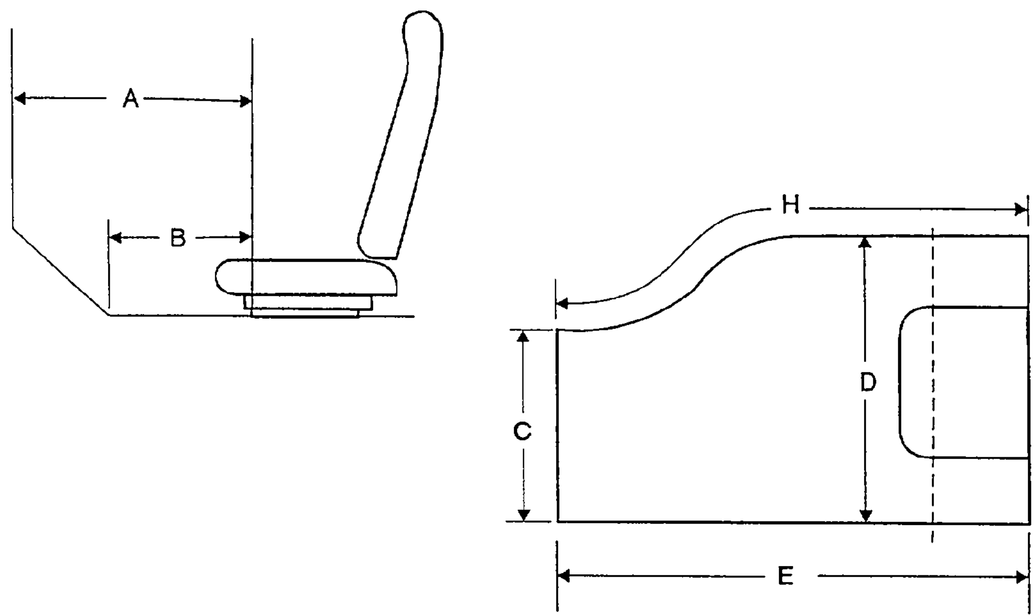
(Driver's Side)



Measurement	Pre-Test	Post-Test	Difference
A	774 mm	515 mm	259 mm
B	522 mm	526 mm	-4 mm
C	315 mm	282 mm	33 mm
D	483 mm	434 mm	49 mm
E	522 mm	476 mm	46 mm
H	533 mm	541 mm	-8 mm
F (cm^2)	NA	NA	NA

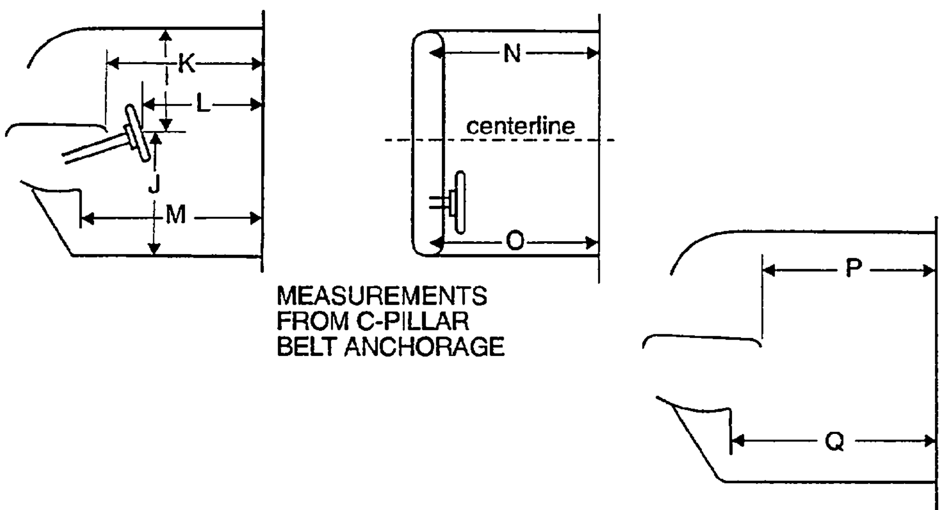
Figure 14 Static Footwell Deformation

(Passenger's Side)



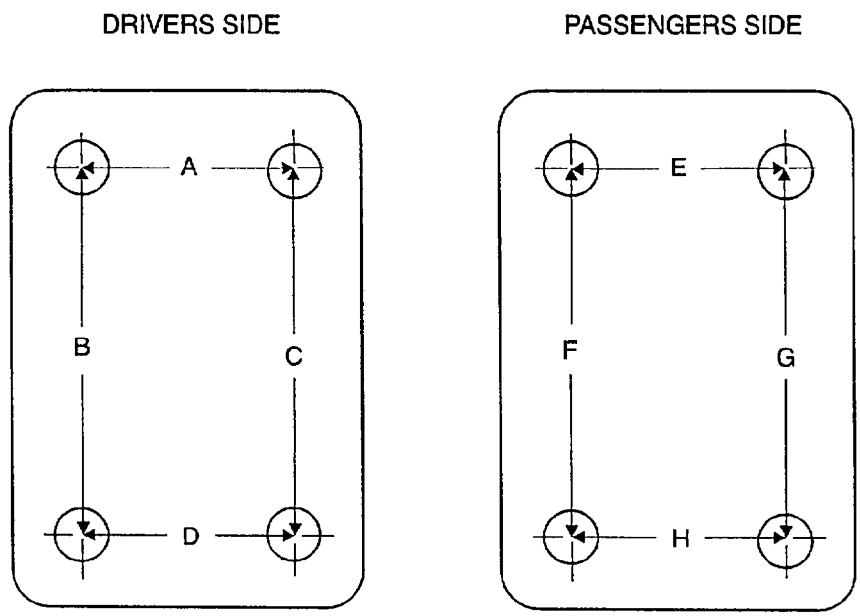
Measurement	Pre-Test	Post-Test	Difference
A	700 mm	509 mm	191 mm
B	540 mm	509 mm	31 mm
C	390 mm	361 mm	29 mm
D	441 mm	434 mm	7 mm
E	540 mm	509 mm	31 mm
H	543 mm	490 mm	53 mm
F (cm^2)	NA	NA	NA

Figure 15 Static Passenger Compartment Intrusion



Measurement	Pre-Test	Post-Test	Difference
I	435 mm	399 mm	36 mm
J	604 mm	656 mm	-52 mm
K	842 mm	757 mm	85 mm
L	590 mm	606 mm	-16 mm
M	818 mm	768 mm	50 mm
N	920 mm	862 mm	58 mm
O	961 mm	859 mm	102 mm
P	818 mm	771 mm	47 mm
Q	813 mm	751 mm	62 mm

Figure 16 Underbody Floorboard Deformation



Measurement	Pre-Test	Post-Test	Difference
A	260 mm	NA[1]	NA[1]
B	370 mm	372 mm	-2 mm
C	433 mm	NA[1]	NA[1]
D	274 mm	NA[1]	NA[1]
E	248 mm	NA[1]	NA[1]
F	432 mm	NA[1]	NA[1]
G	470 mm	NA[1]	NA[1]
H	286 mm	NA[1]	NA[1]

[1] All other targets fell off.

<u>Appendix A</u>

Photographs

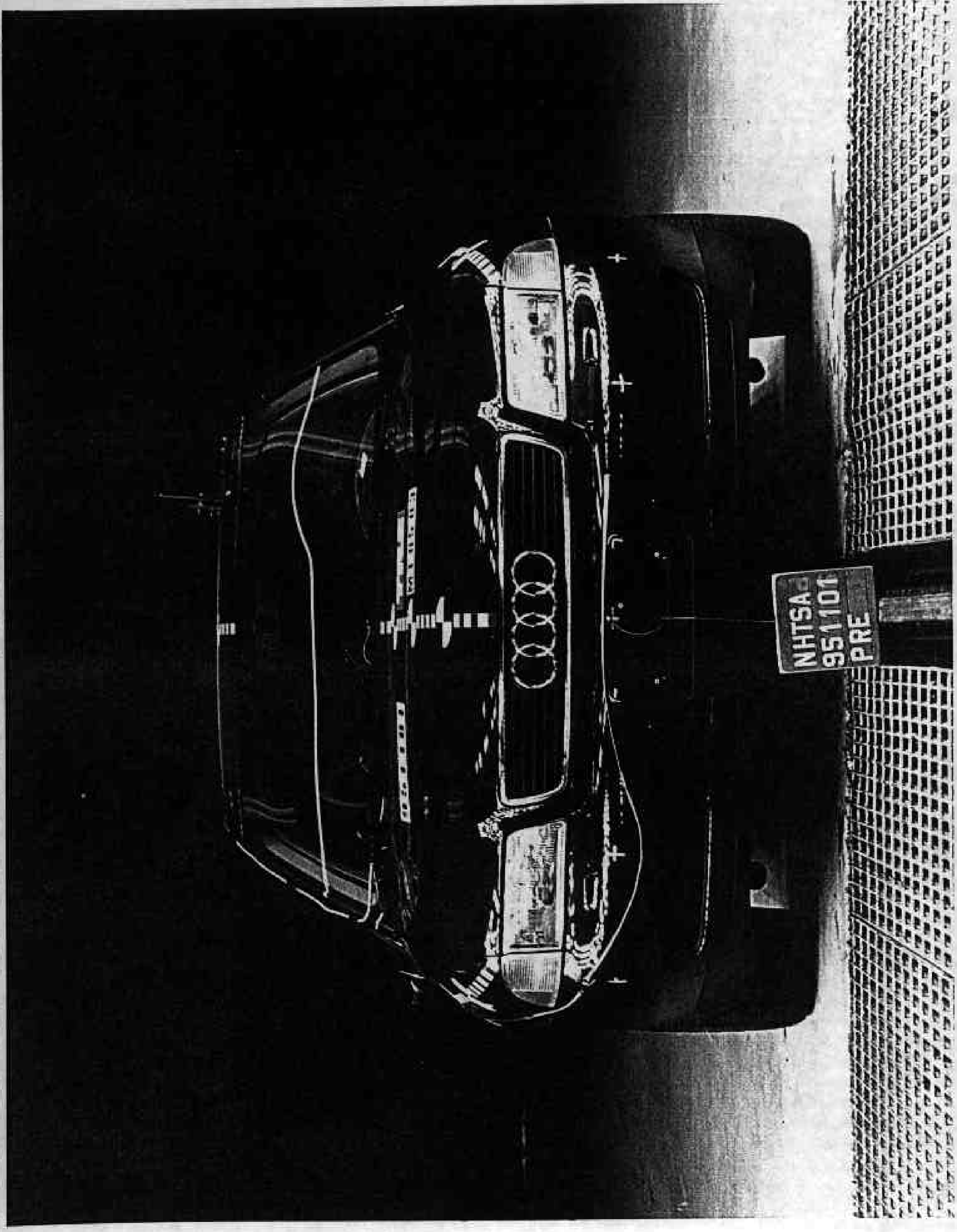


Figure A-1. Pre-Test Front View

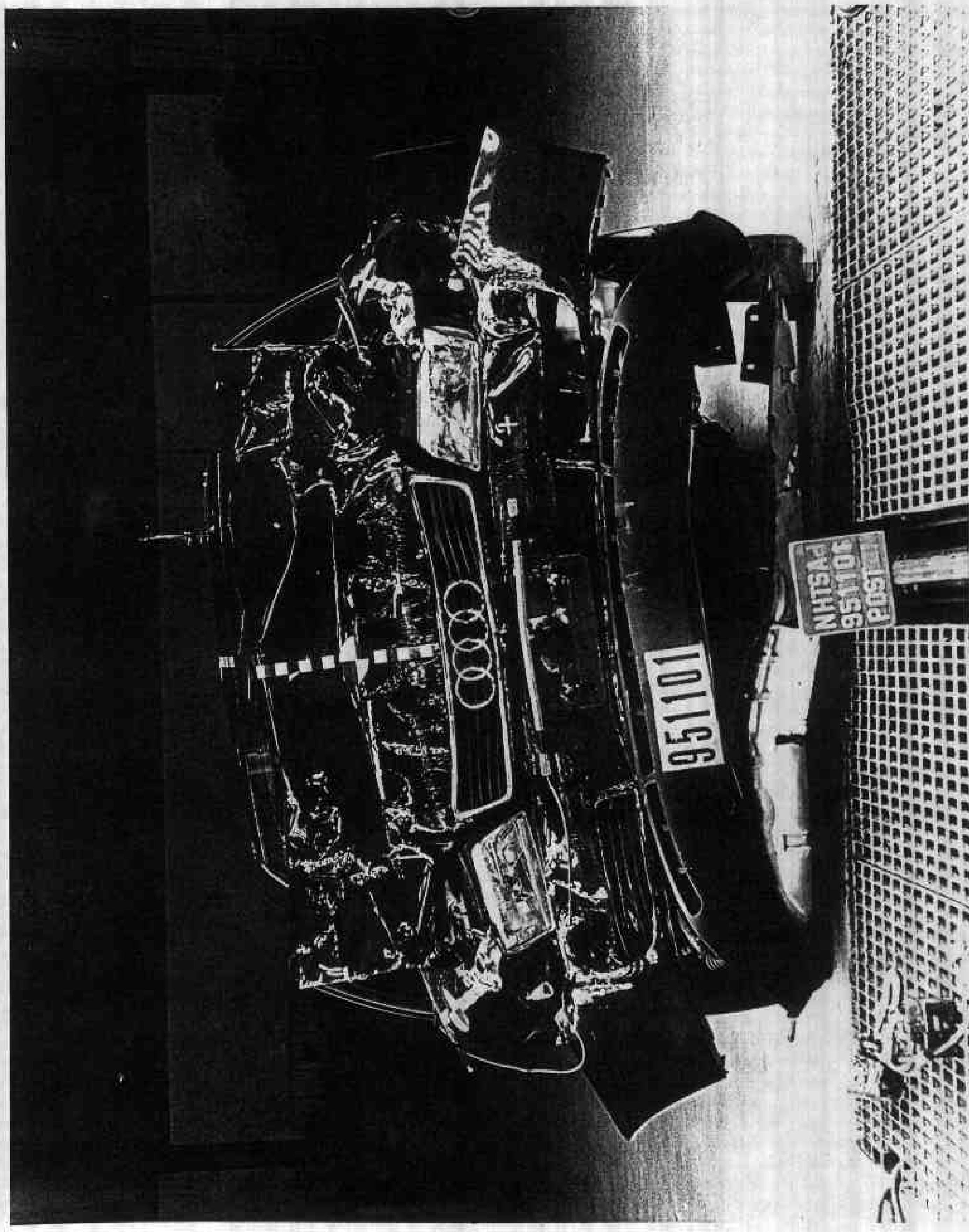


Figure A-2. Post-Test Front View

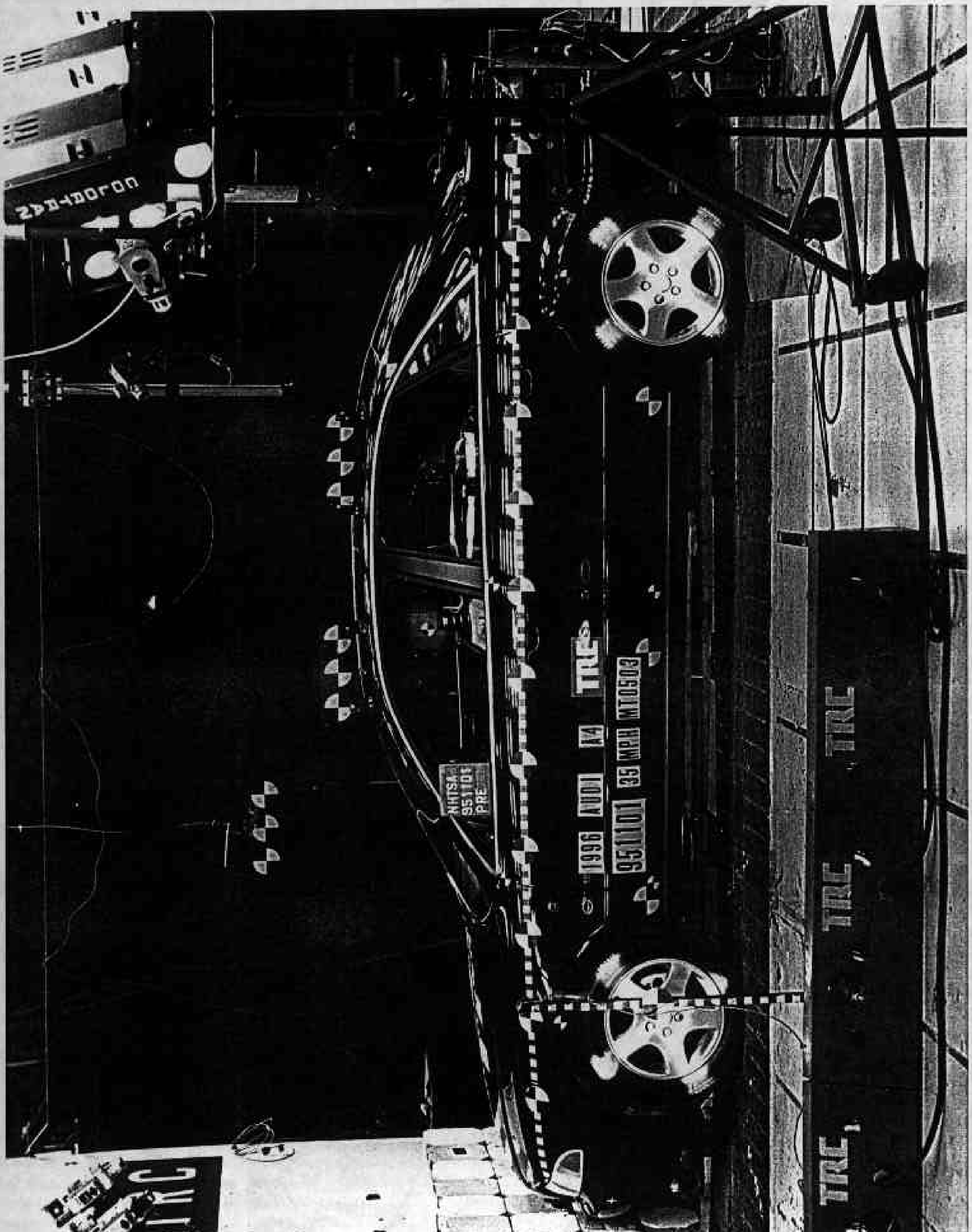


Figure A-3. Pre-Test Left Side View

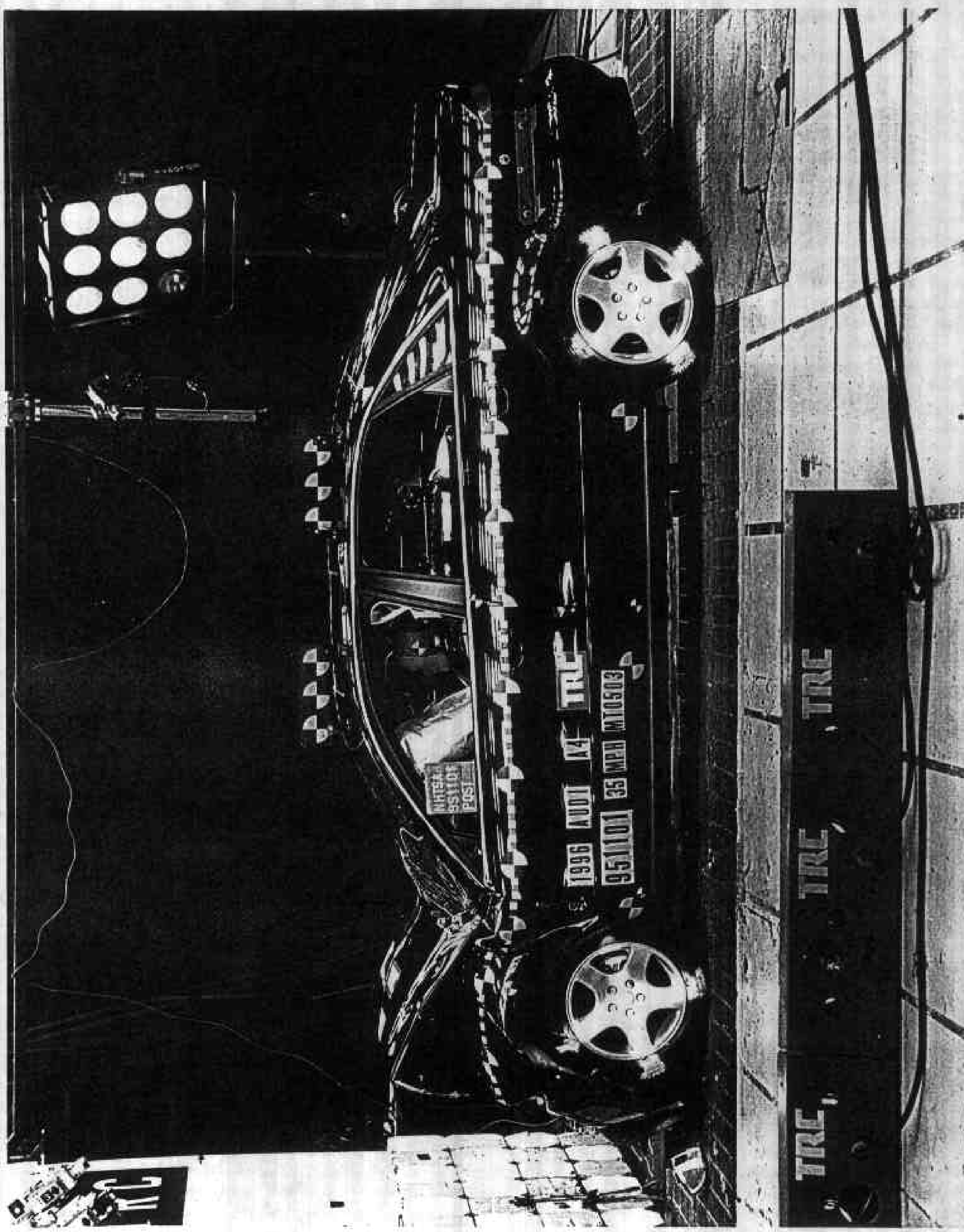


Figure A-4. Post-Test Left Side View

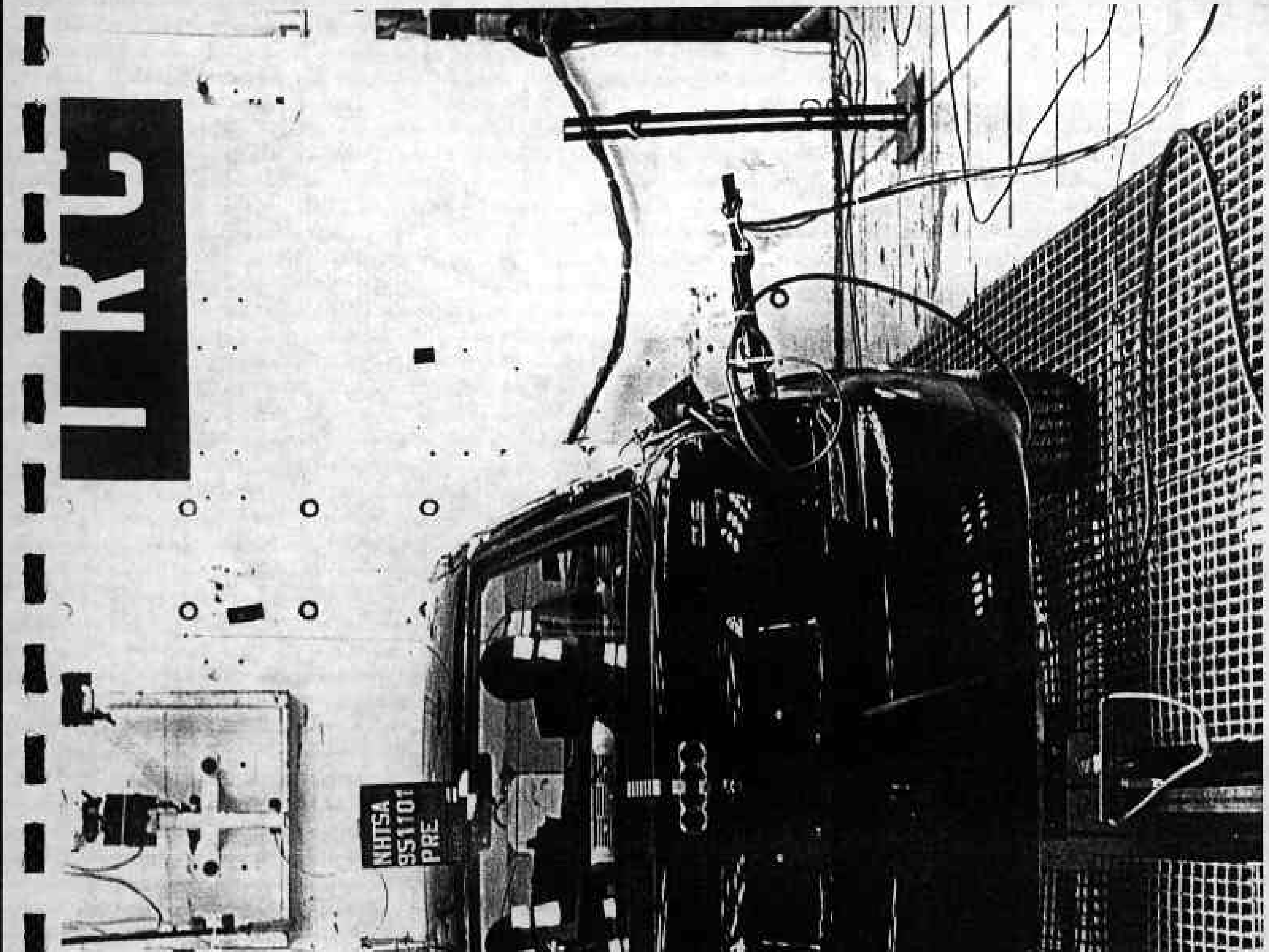


Figure A-5. Pre-Test Rear View

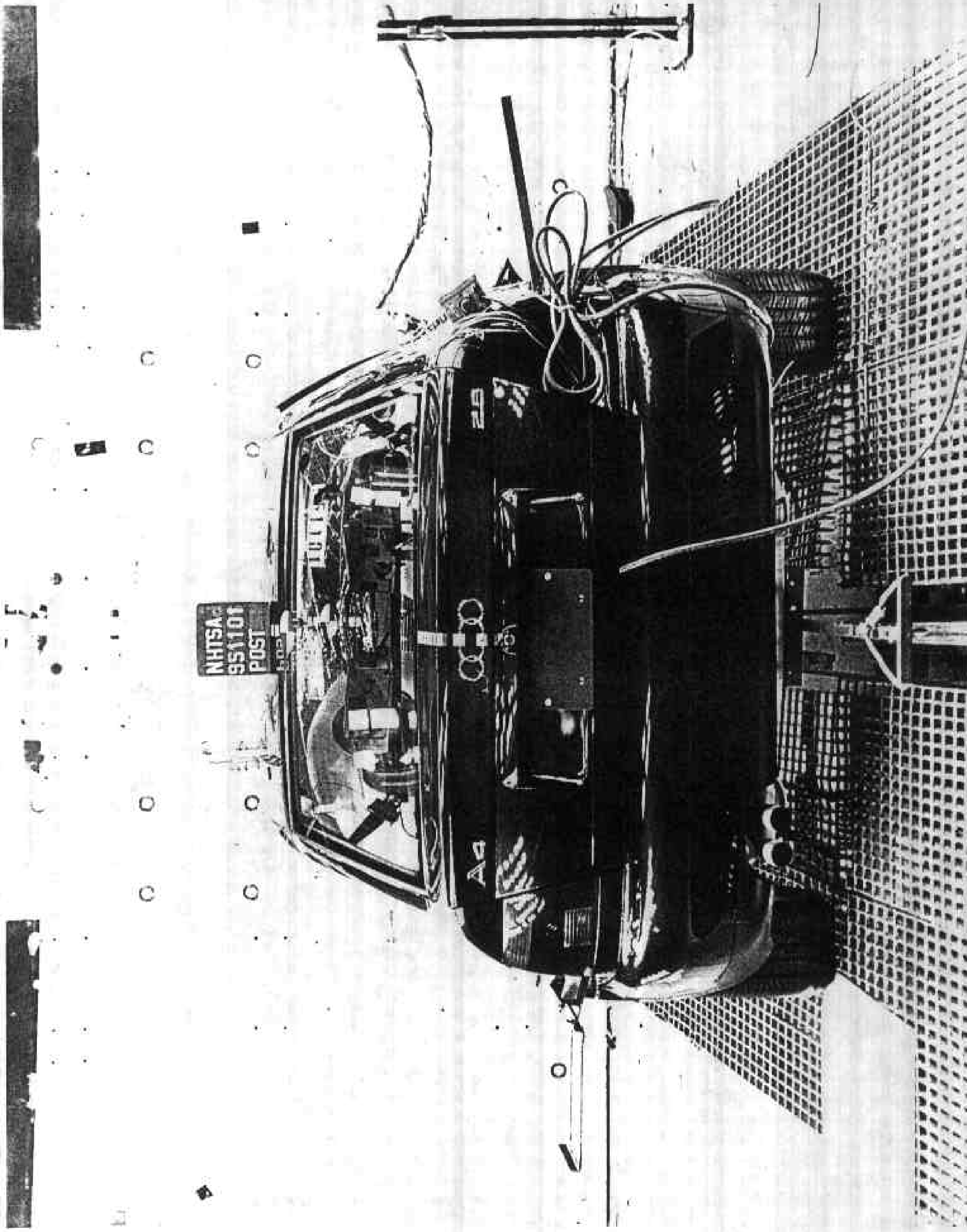


Figure A-6. Post-Test Rear View

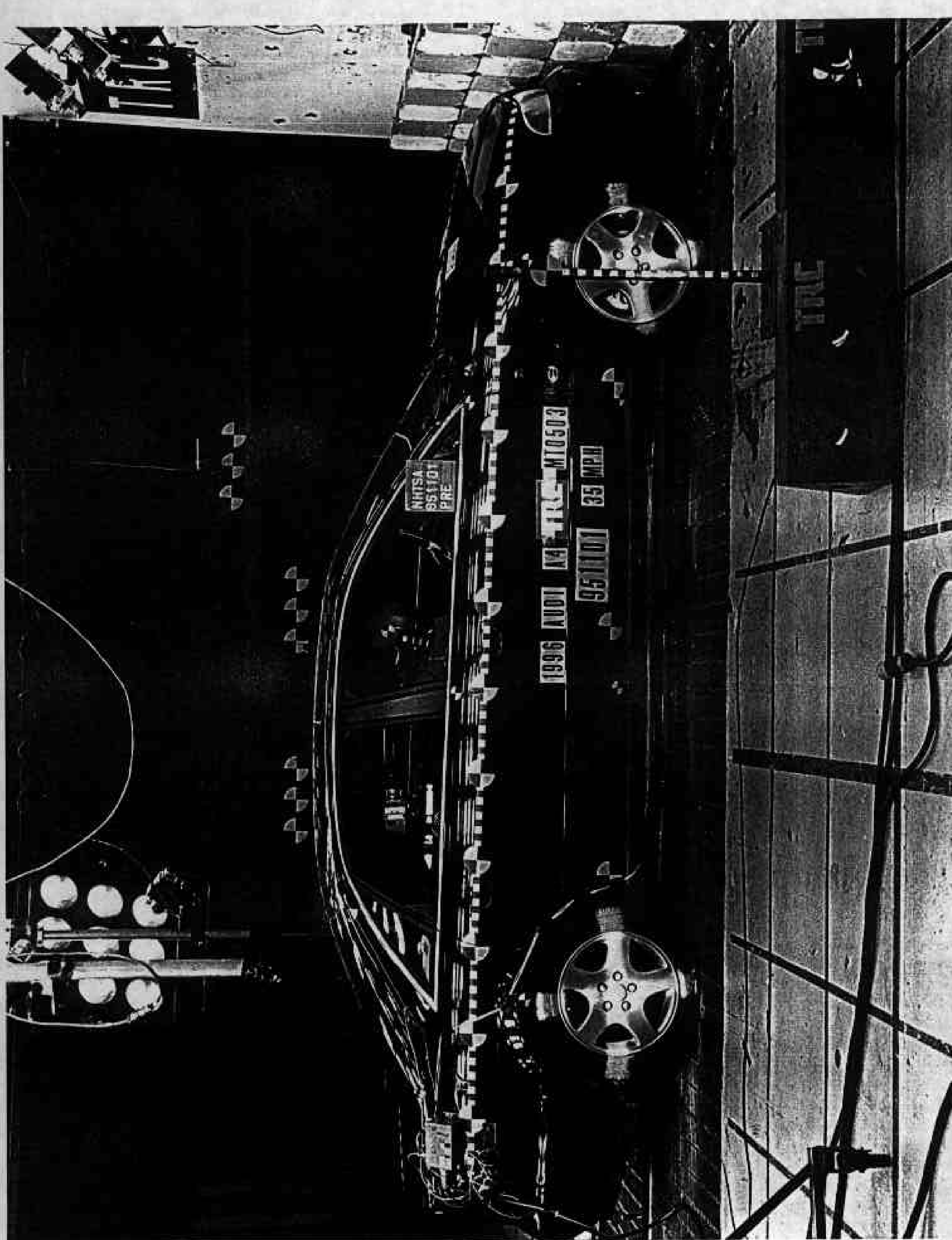


Figure A-7. Pre-Test Right Side View

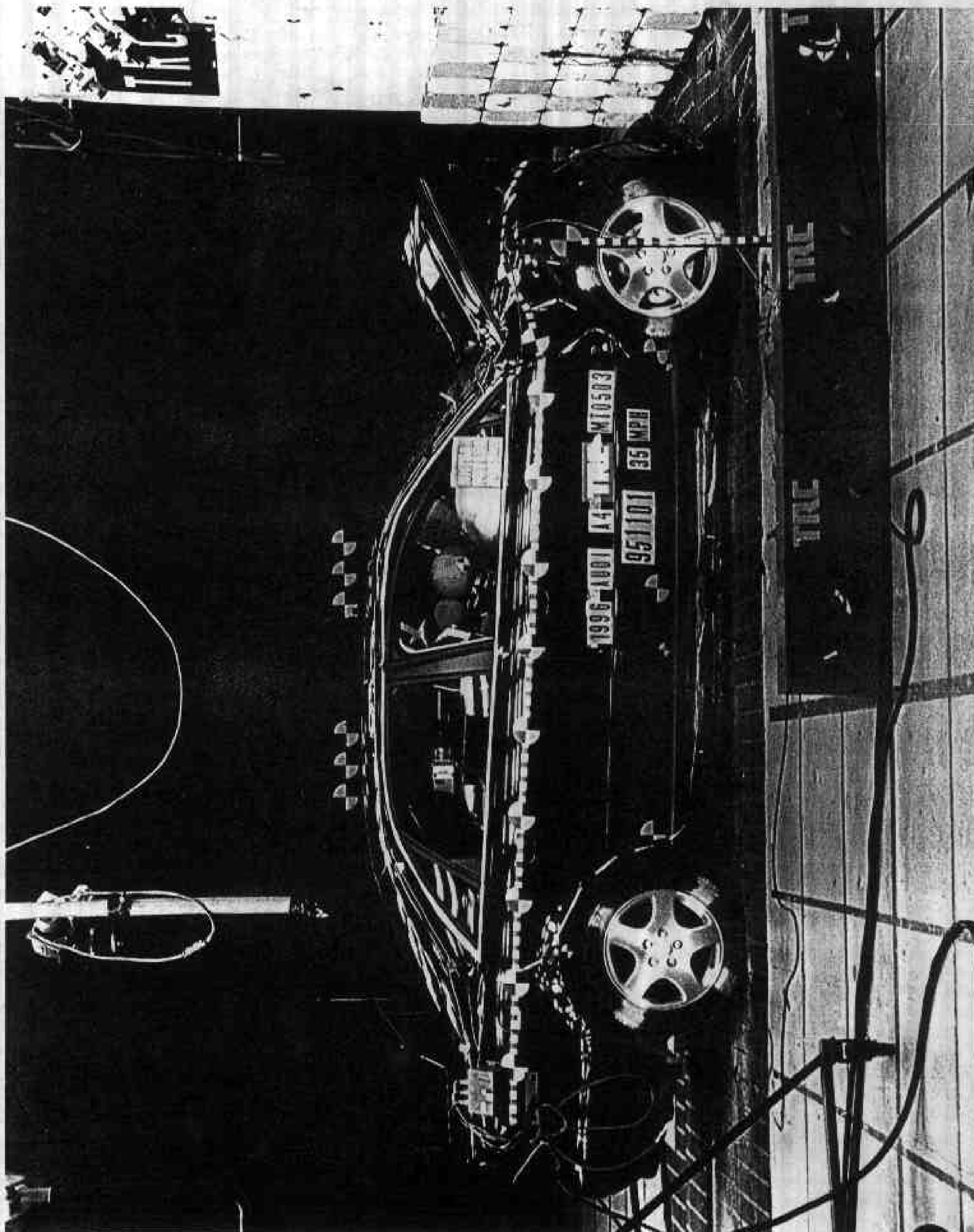


Figure A-8. Post-Test Right Side View

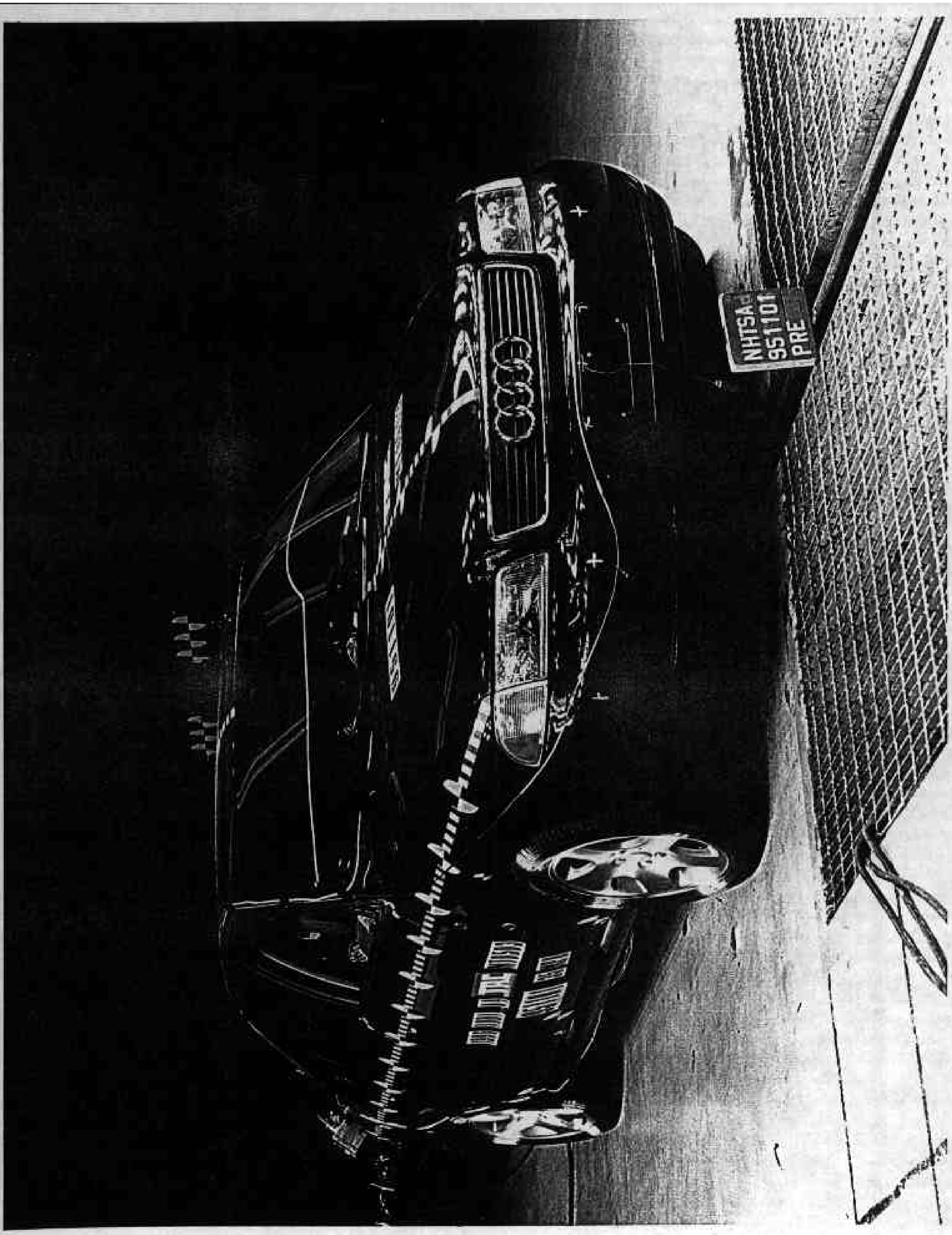


Figure A-9. Pre-Test Right Front Three-Quarter View

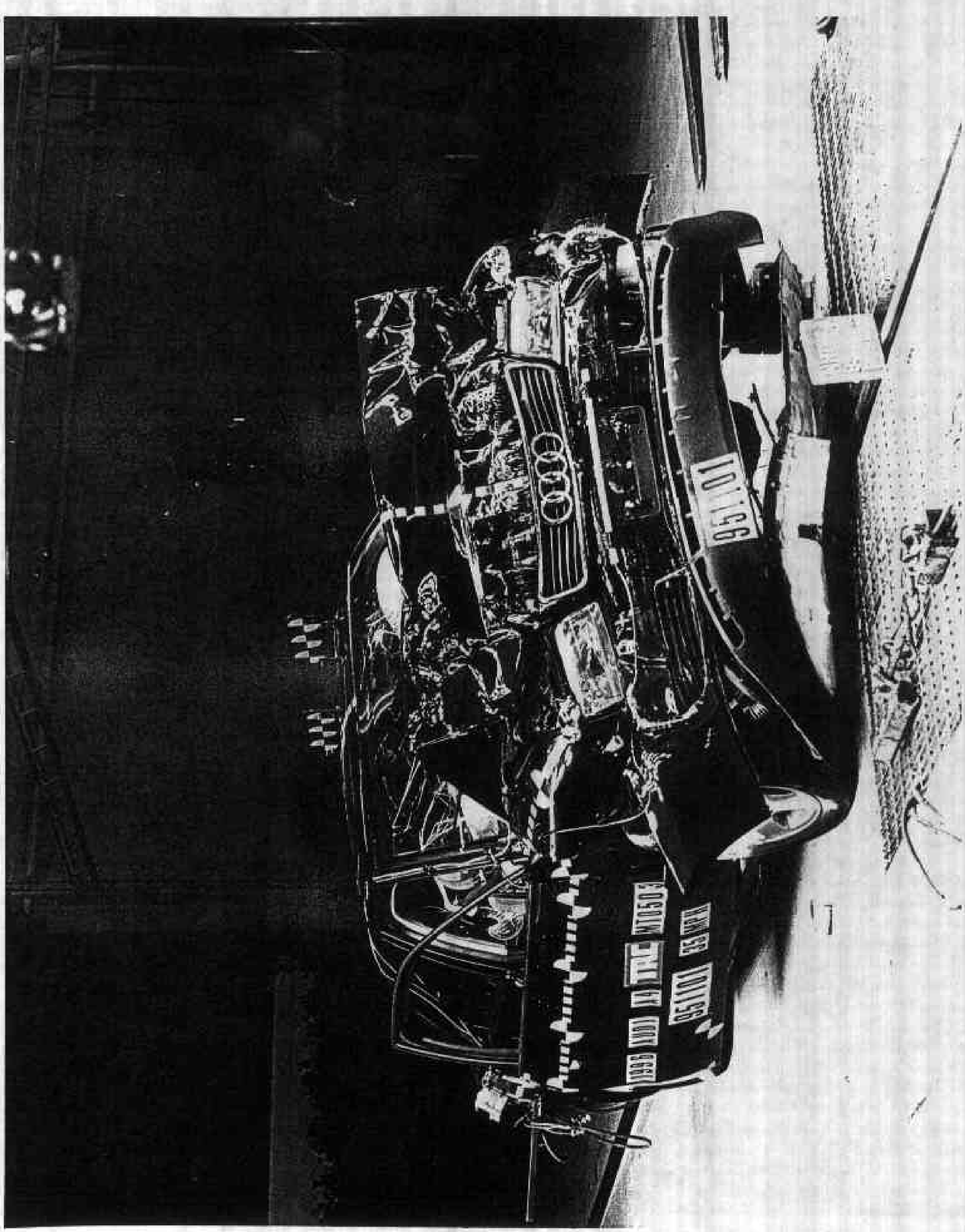


Figure A-10. Post-Test Right Front Three-Quarter View

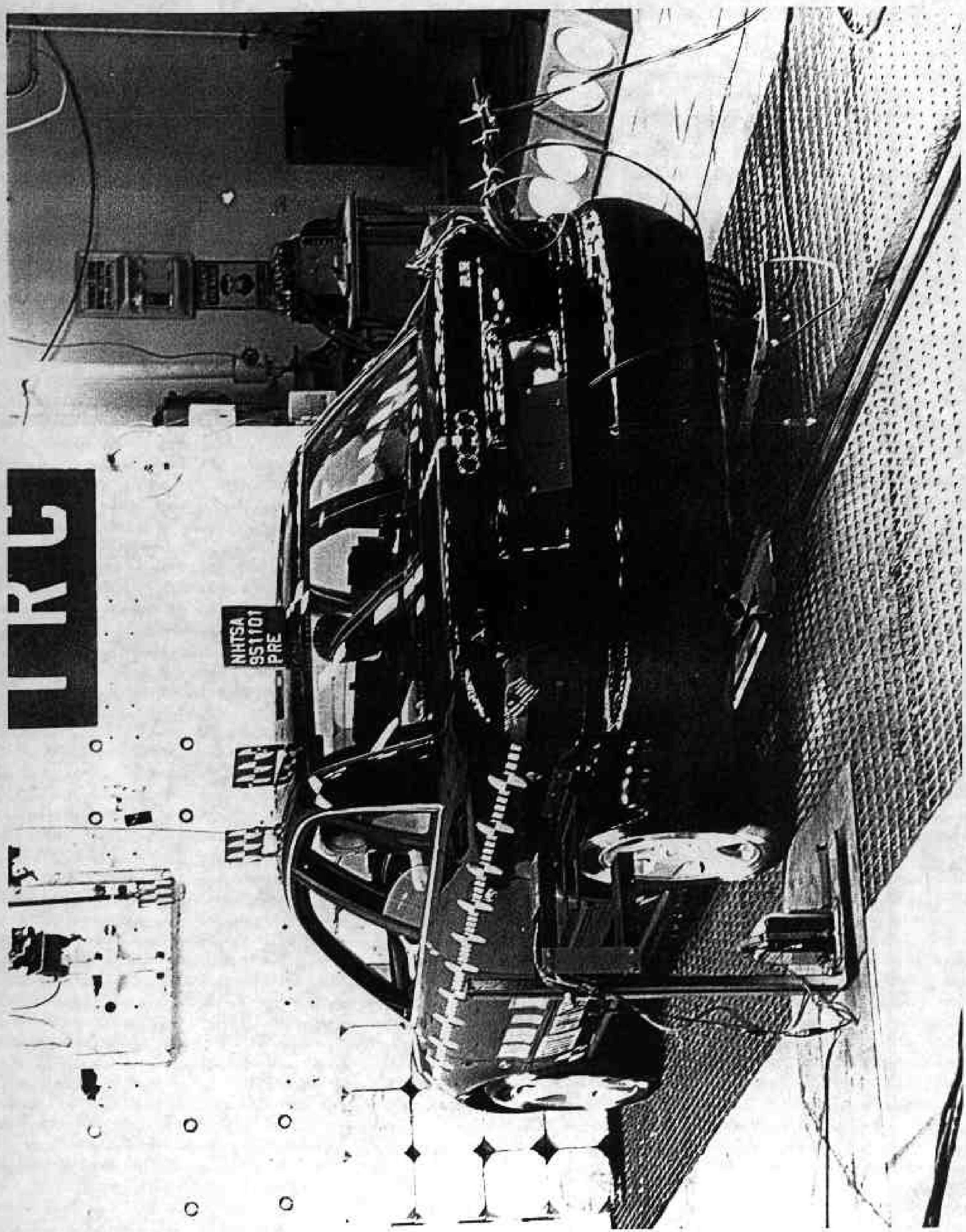


Figure A-11. Pre-Test Left Rear Three-Quarter View

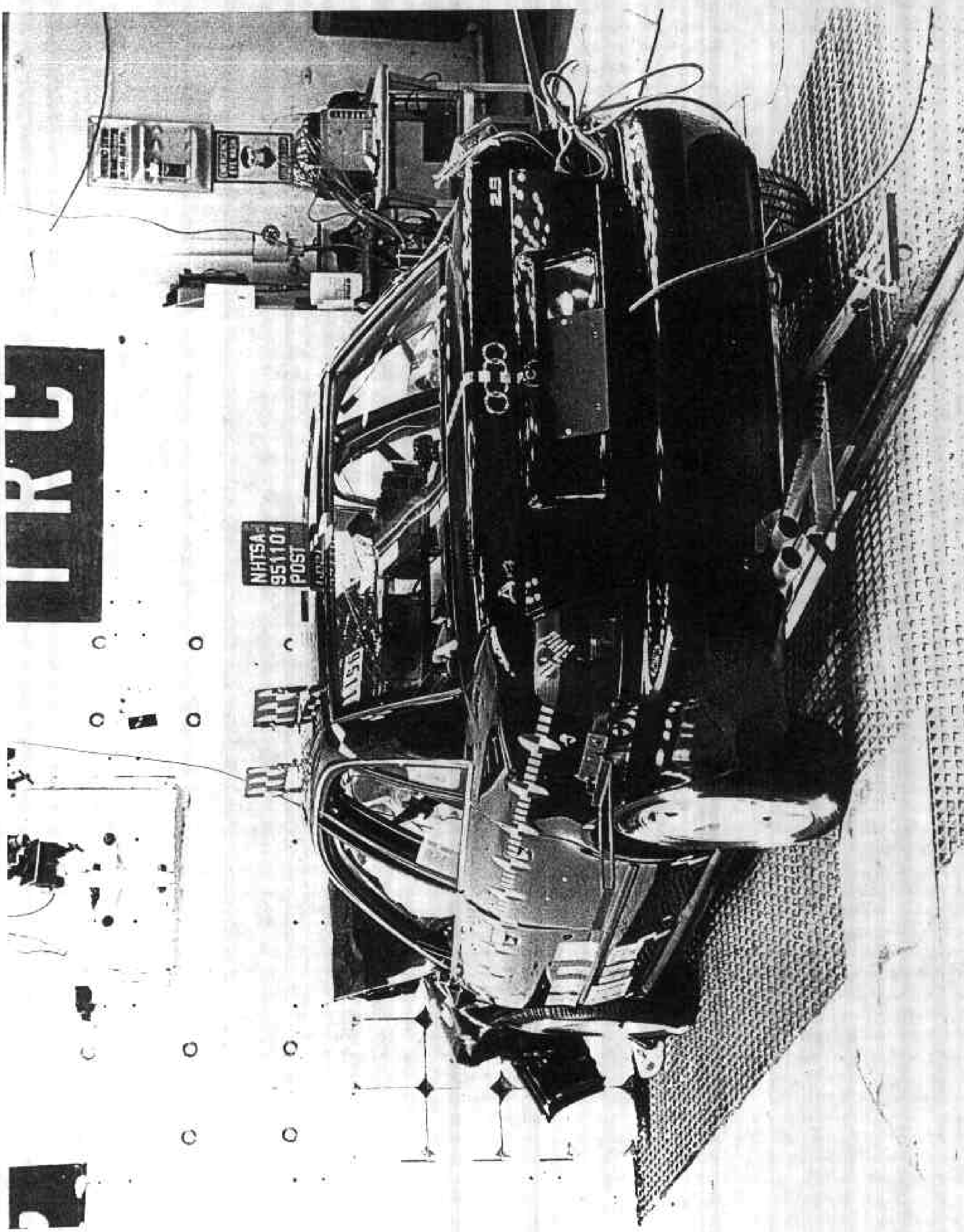


Figure A-12. Post-Test Left Rear Three-Quarter View

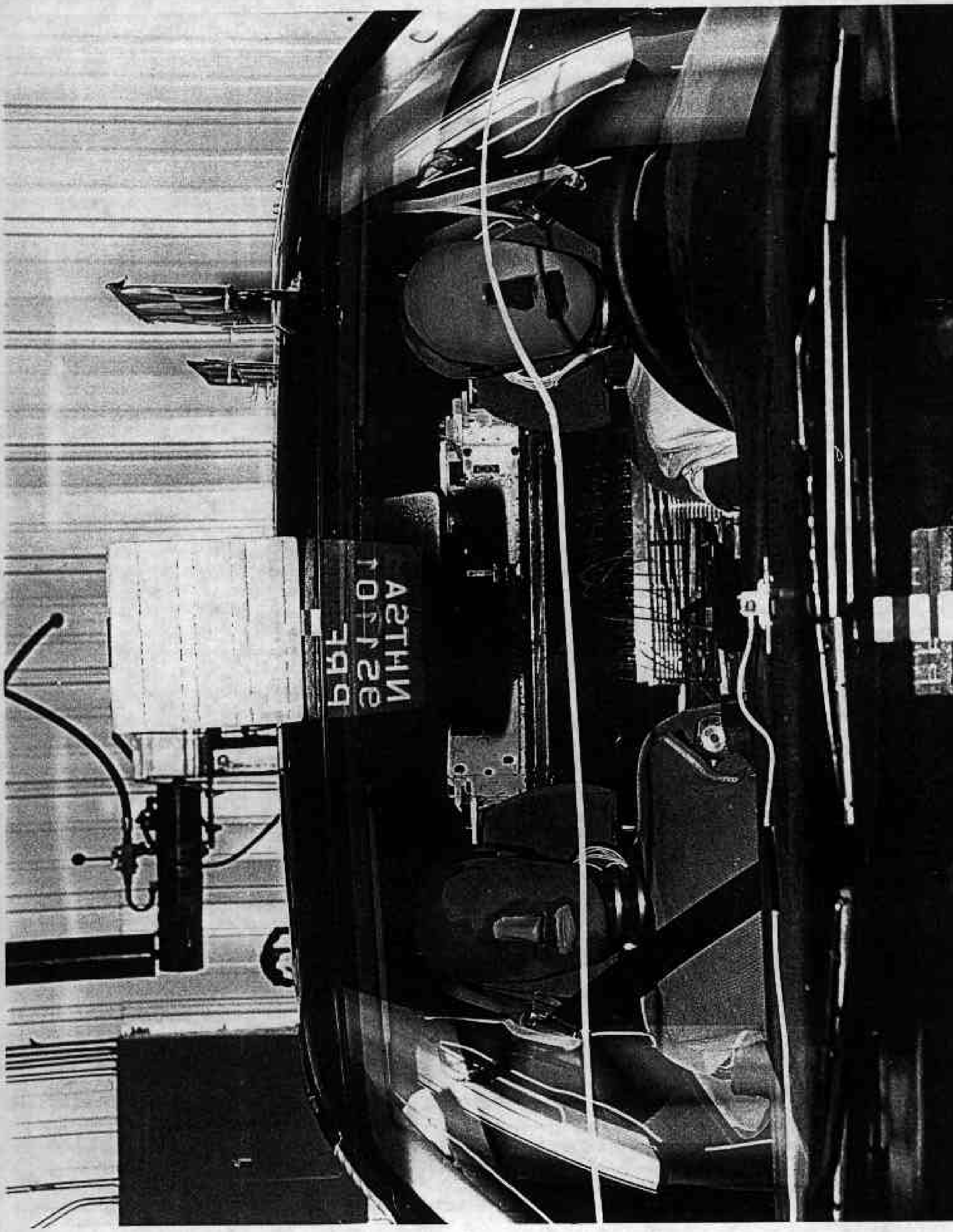


Figure A-13. Pre-Test Windshield View

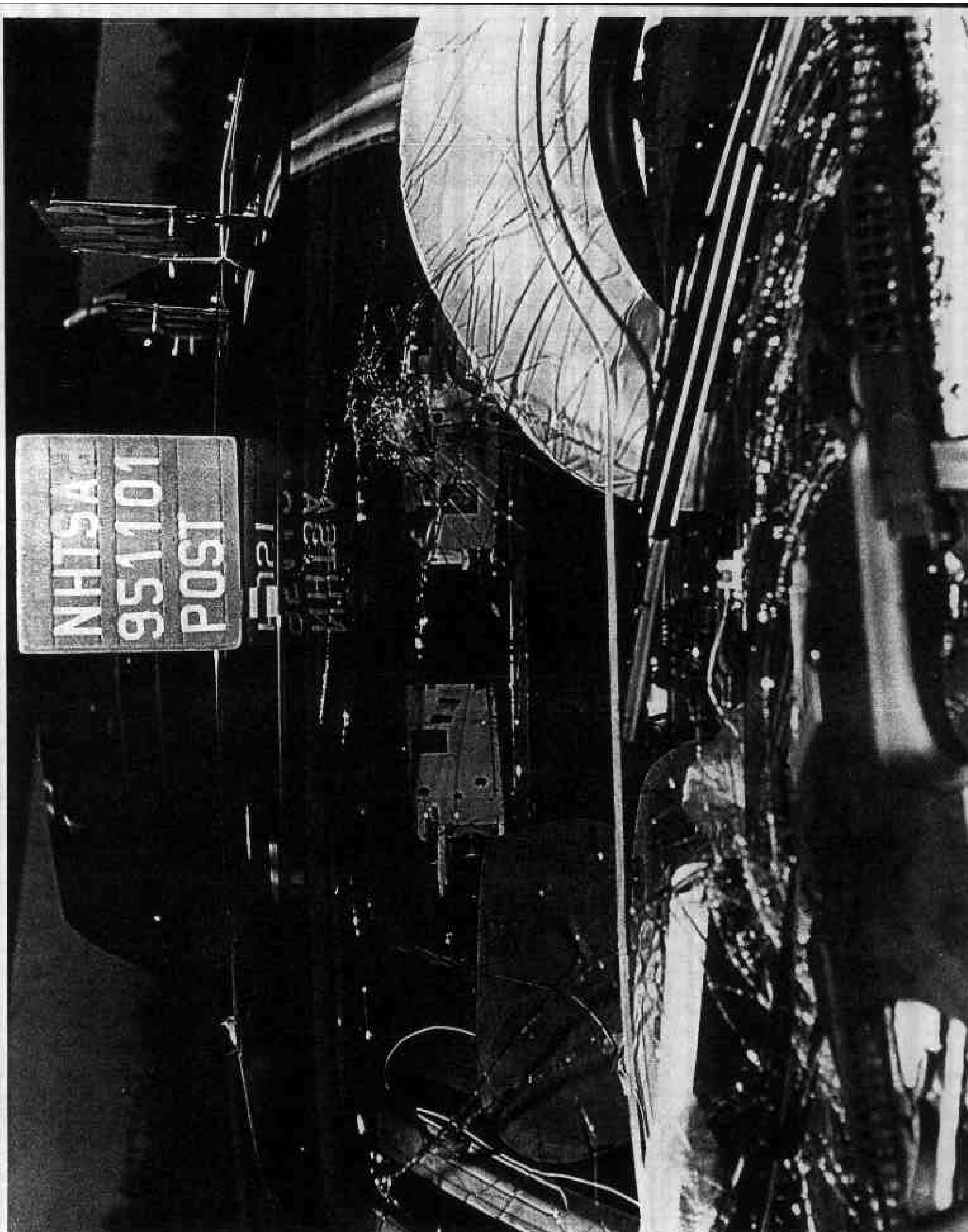


Figure A-14. Post-Test Windshield View

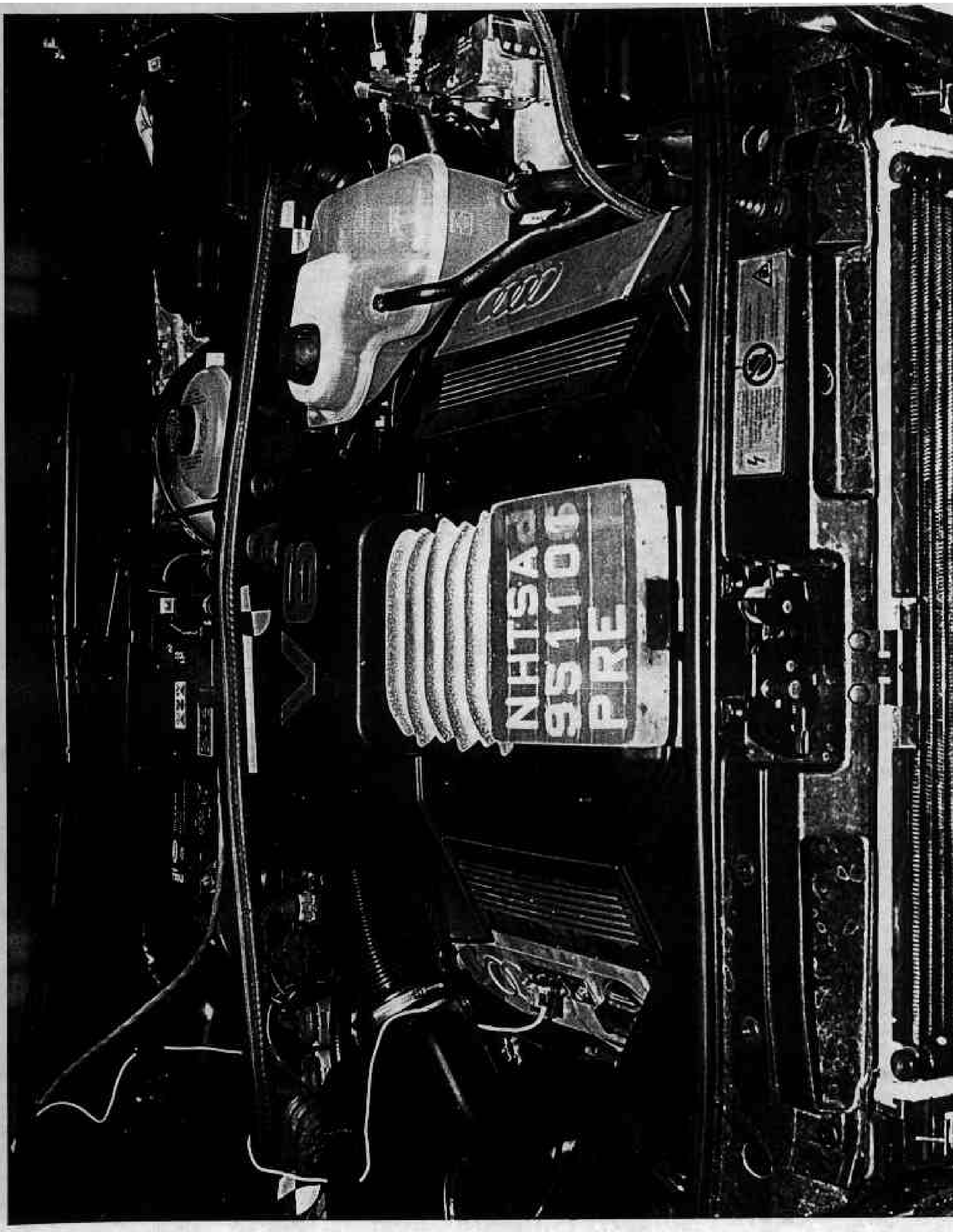


Figure A-15. Pre-Test Engine Compartment View

Figure A-16. Post-Test Engine Compartment View

Figure A-17. Pre-Test Fuel Filler Cap View

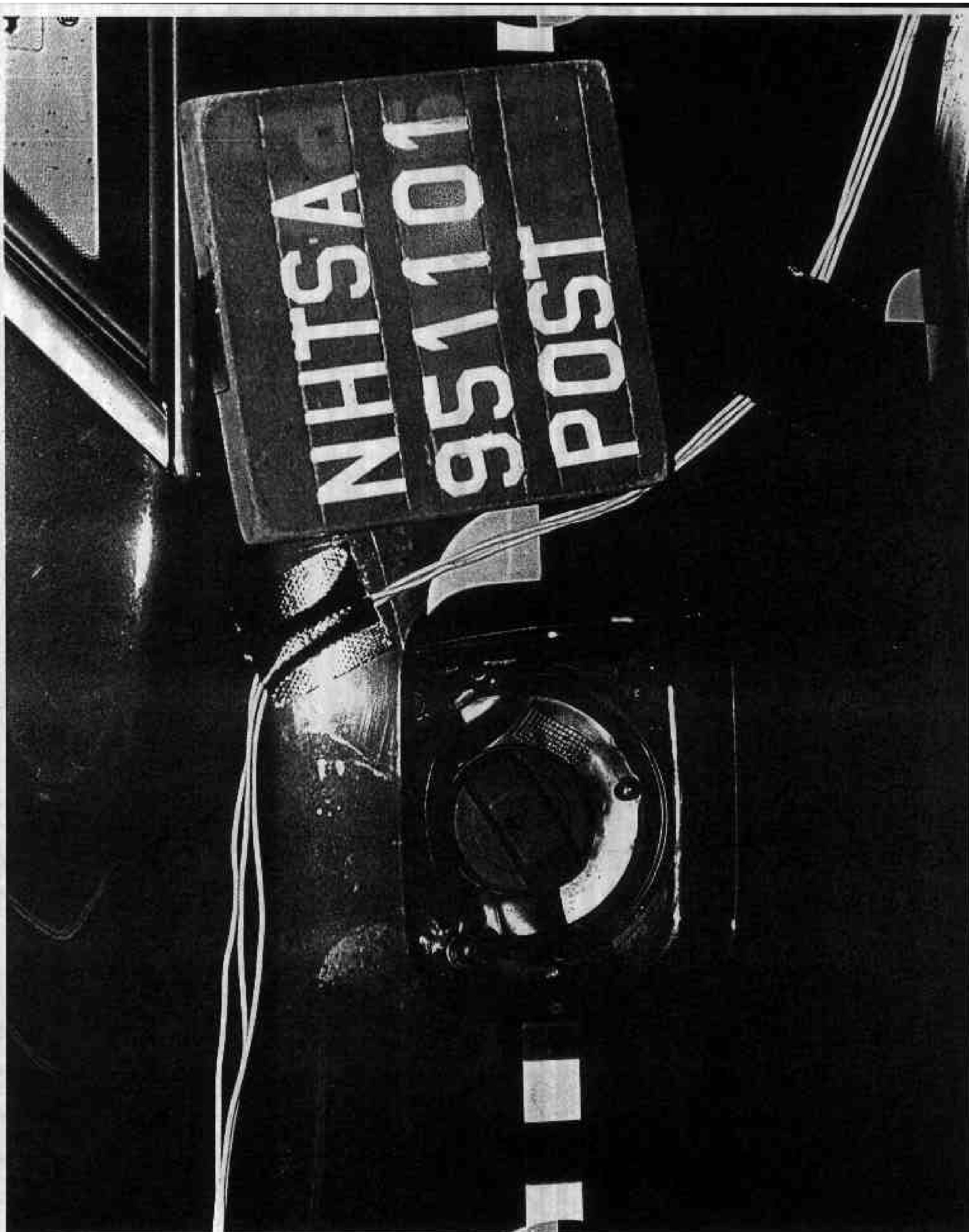


Figure A-18. Post-Test Fuel Filler Cap View

Figure A-19. Pre-Test Fuel Tank View

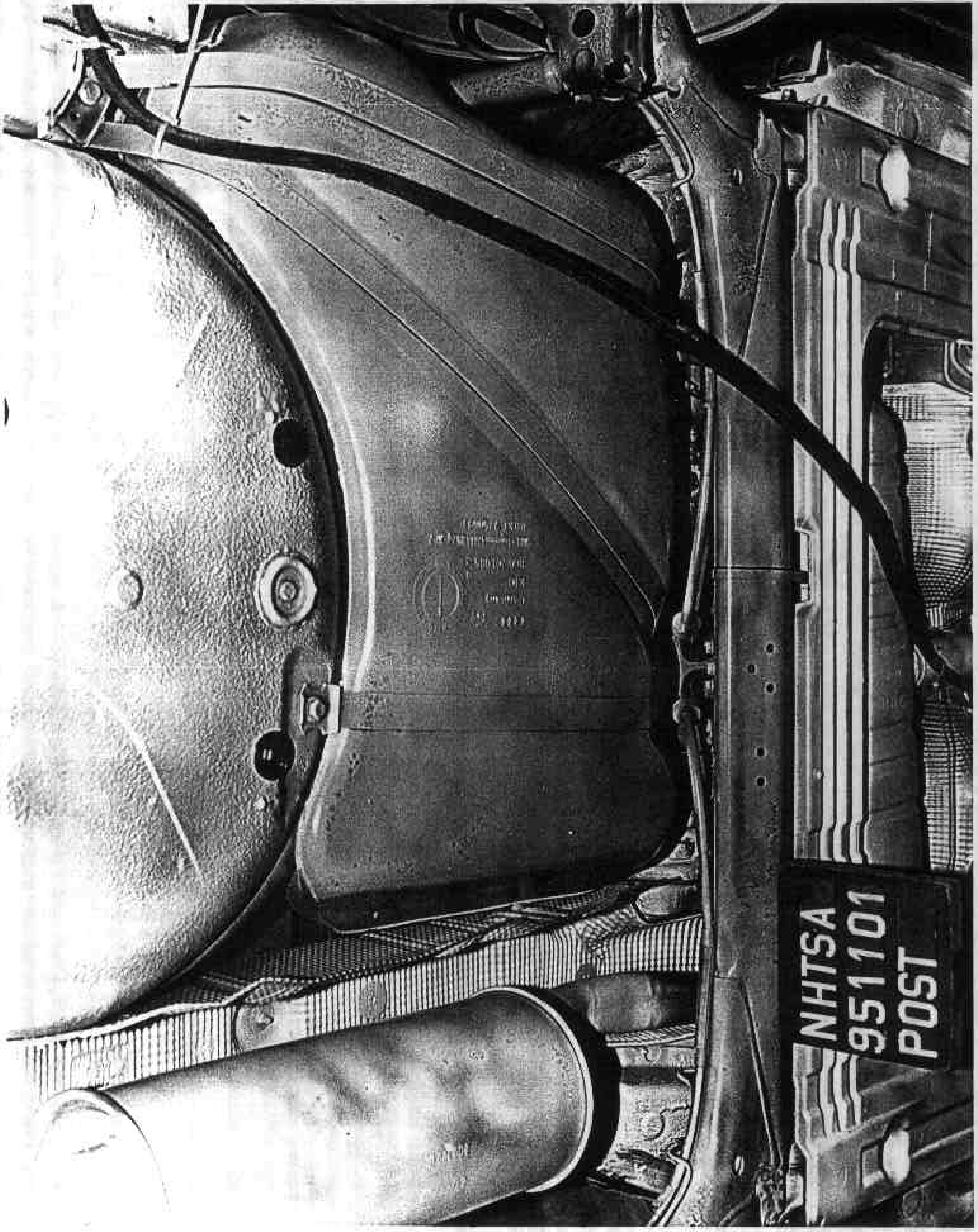


Figure A-20. Post-Test Fuel Tank View

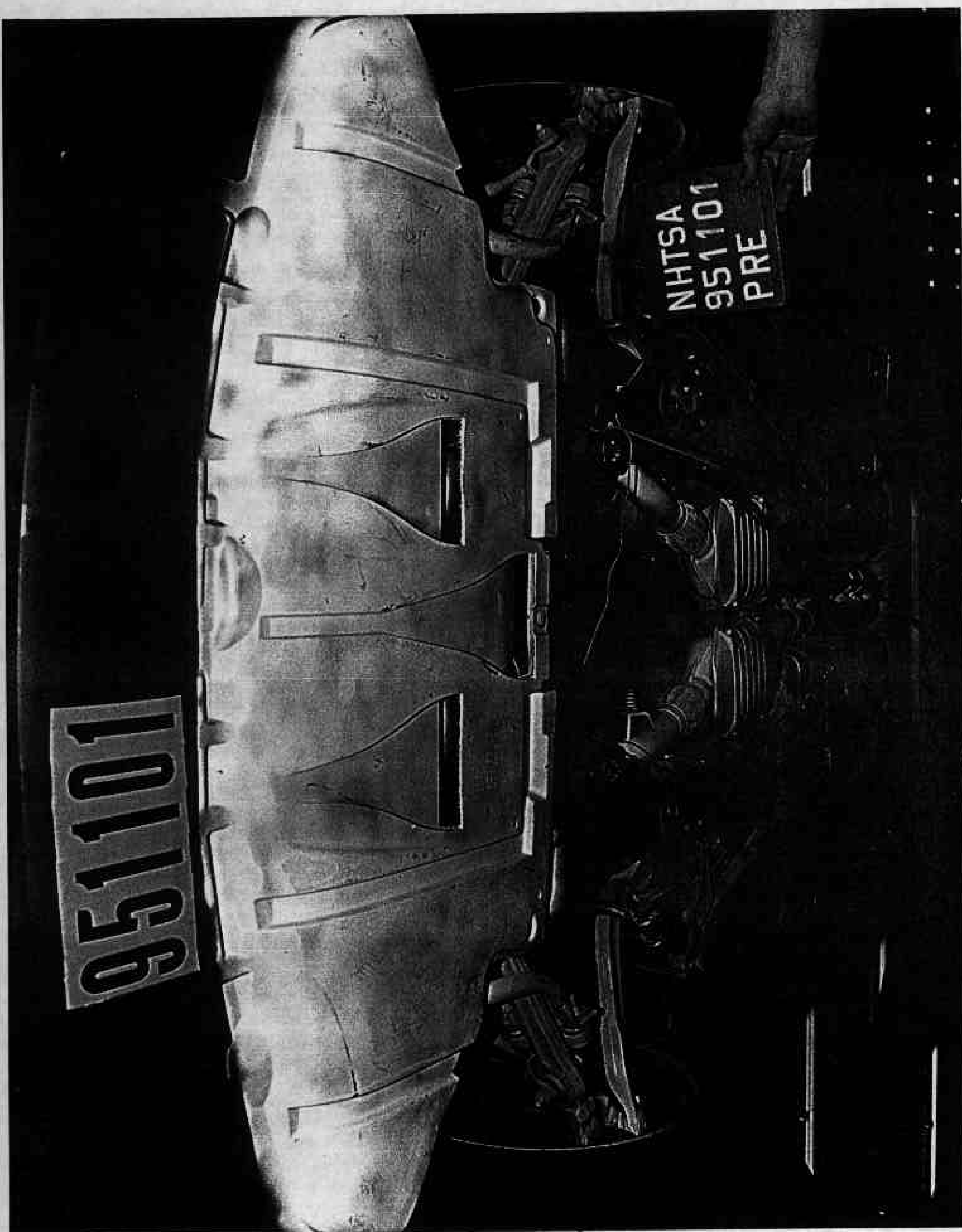


Figure A-21. Pre-Test Front Underbody View

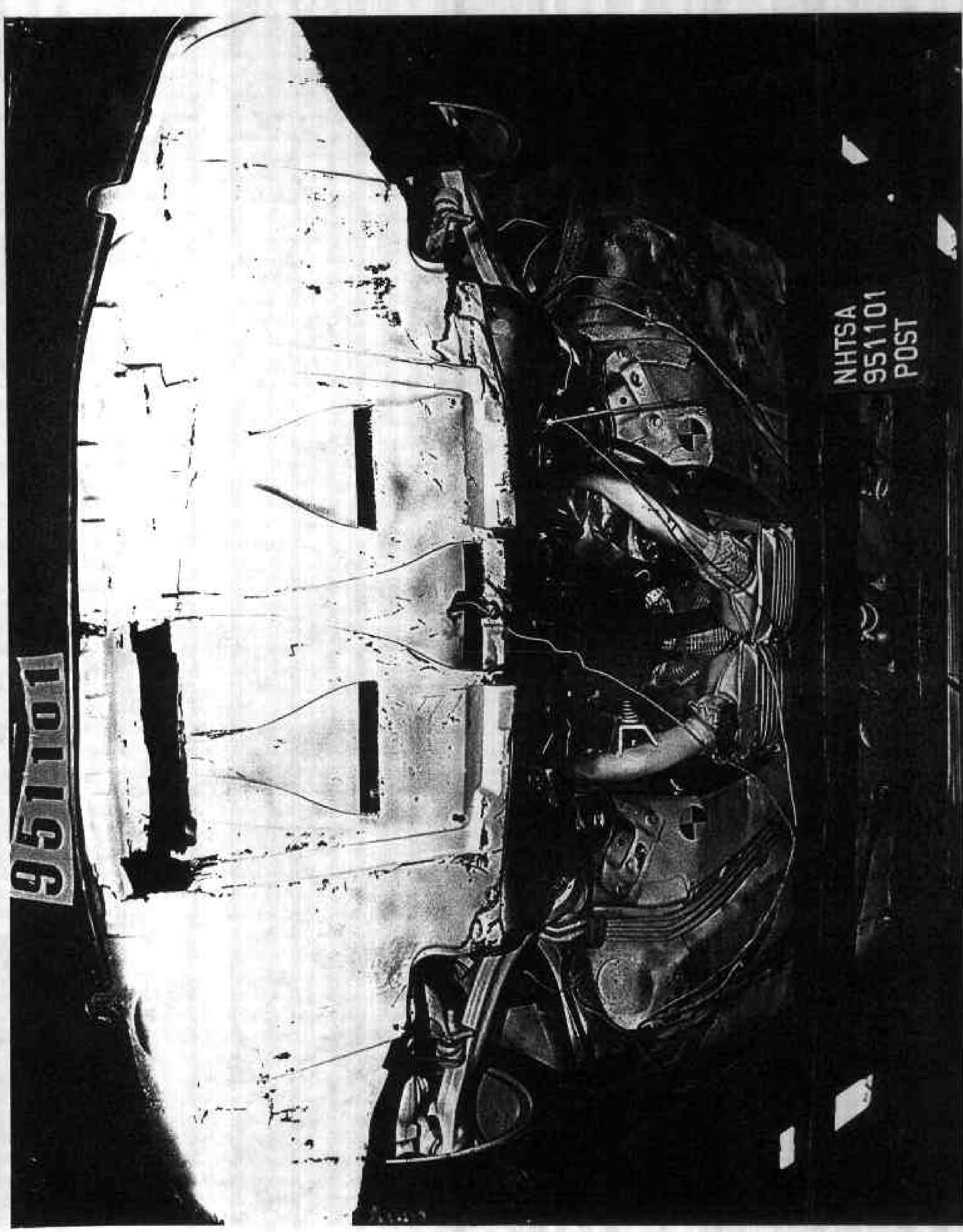


Figure A-22. Post-Test Front Underbody View

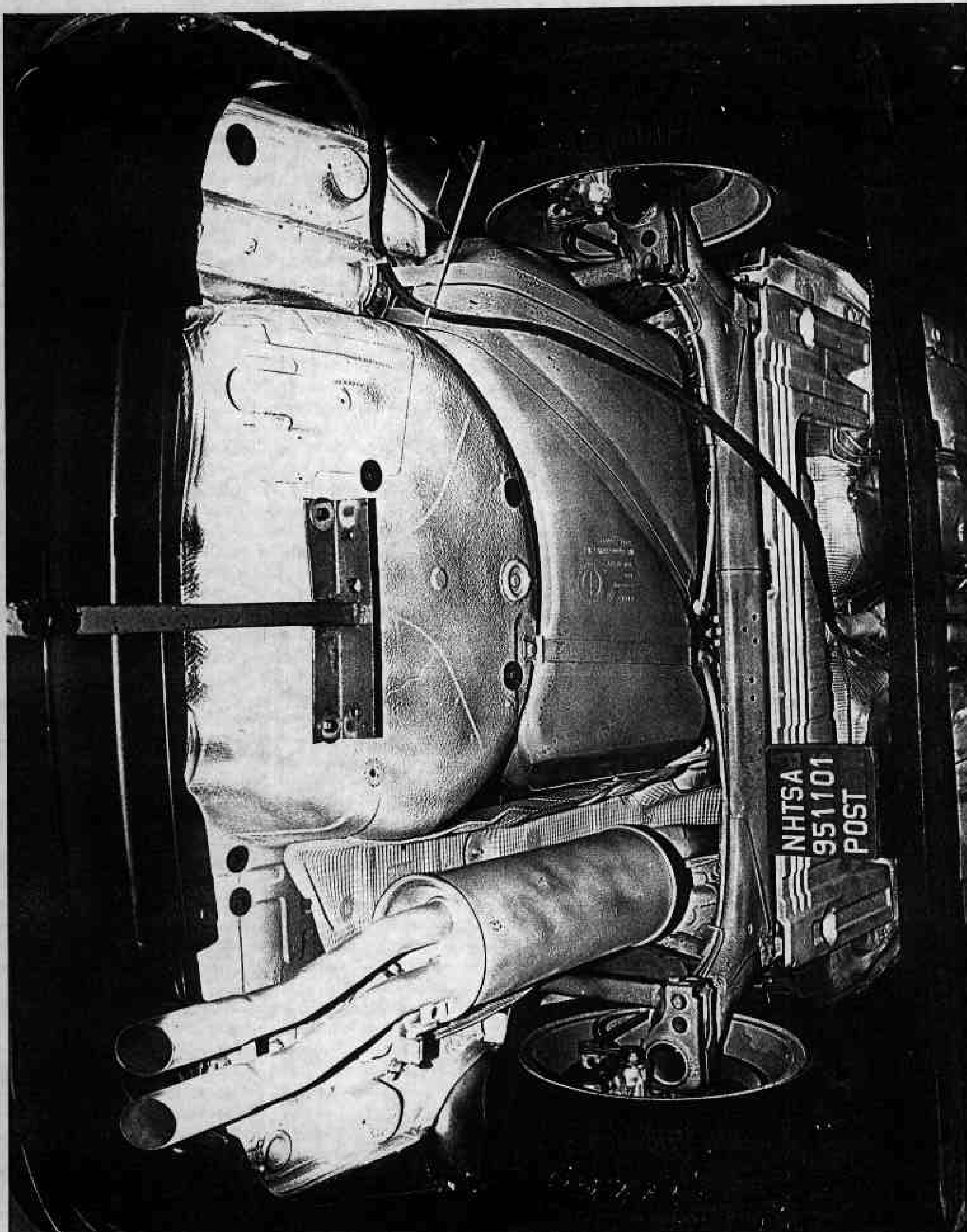


Figure A-23. Post-Test Rear Underbody View

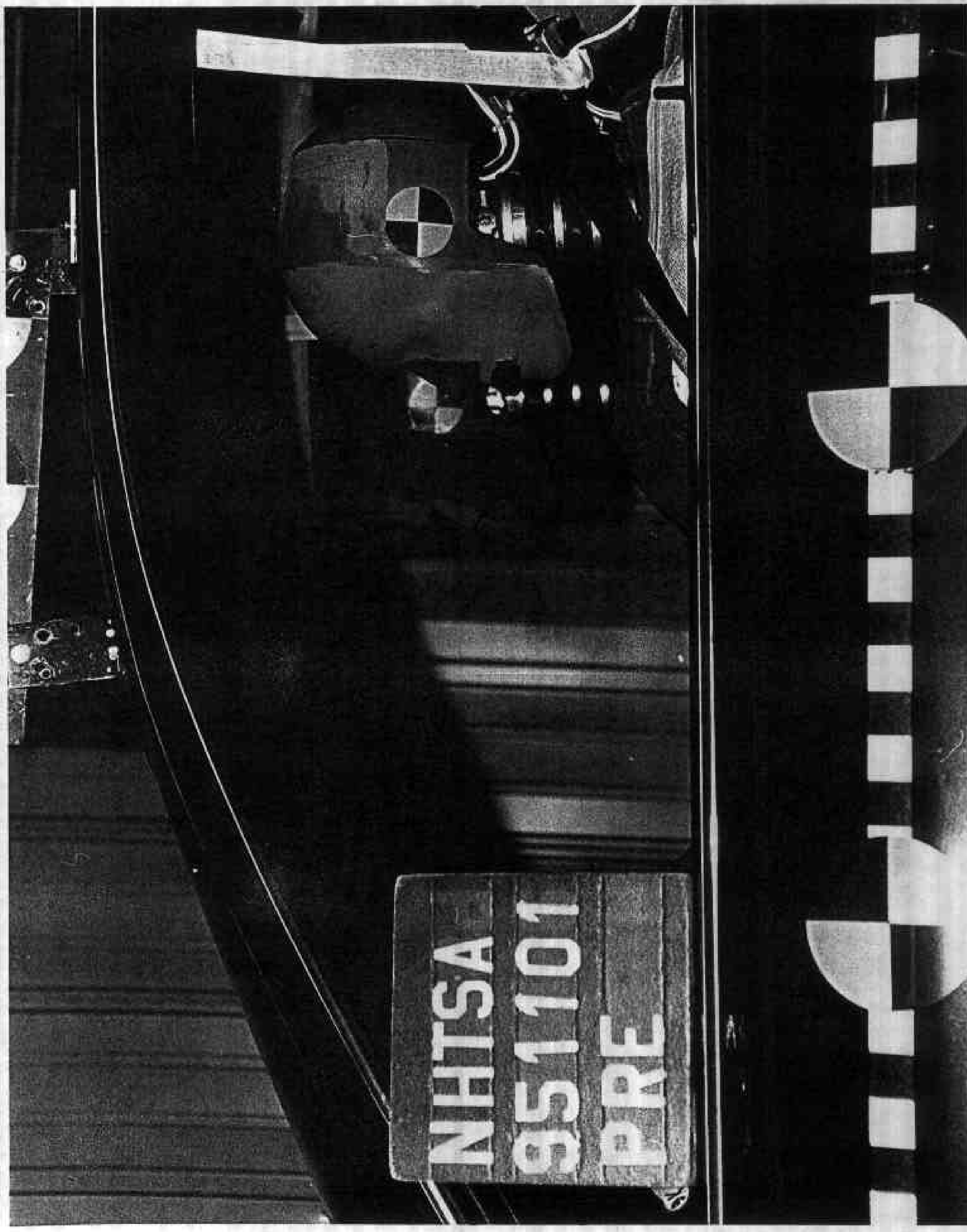


Figure A-24. Pre-Test Driver Dummy Position View

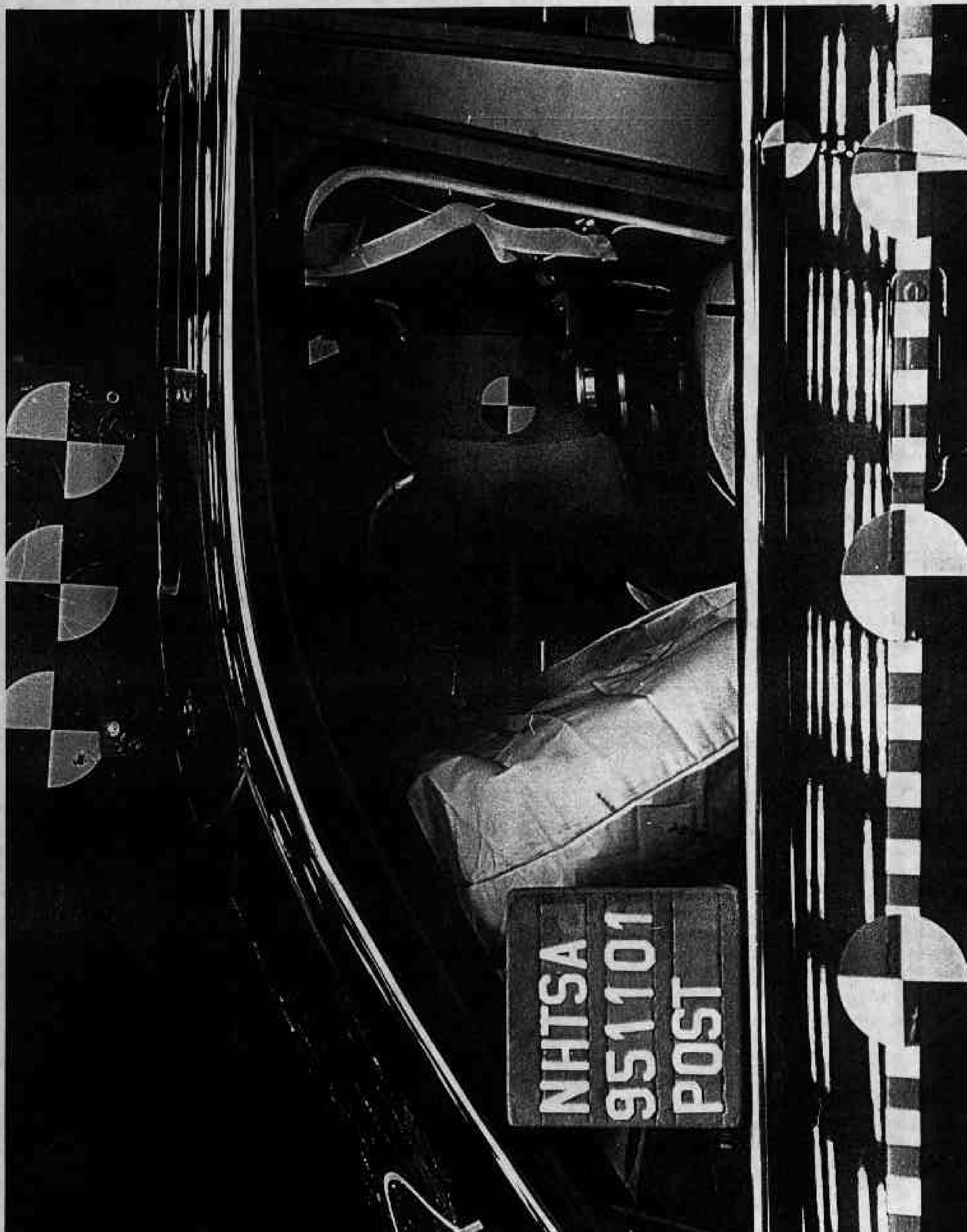


Figure A-25. Post-Test Driver Dummy Position View

Figure A-26. Post-Test Passenger Dummy Position View

Figure A-27. Pre-Test Driver Dummy & Vehicle Interior - View 1

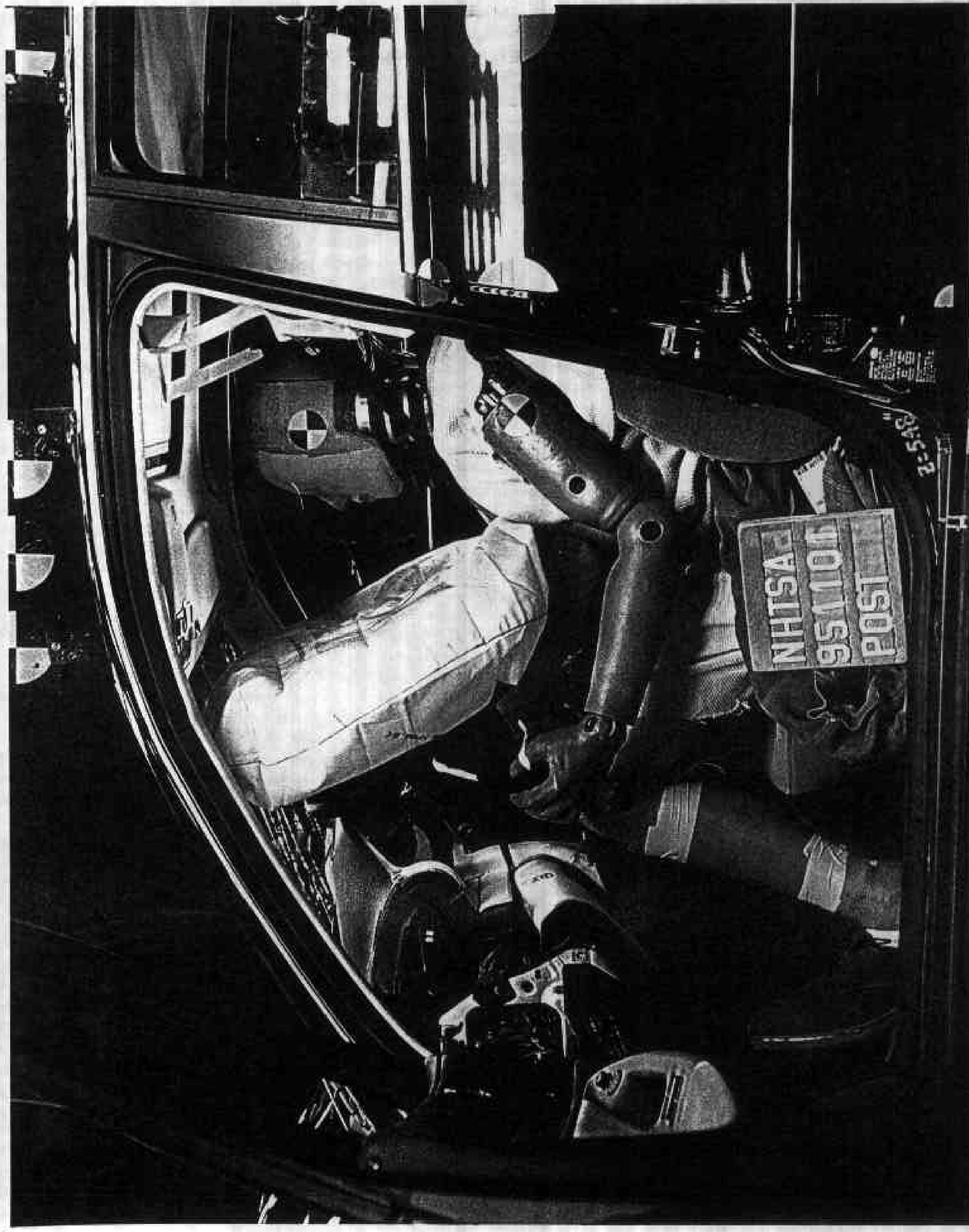


Figure A-28. Post-Test Driver Dummy & Vehicle Interior - View 1

Figure A-29. Pre-Test Driver Dummy & Vehicle Interior - View 2

Figure A-30. Post-Test Driver Dummy & Vehicle Interior - View 2

Figure A-31. Pre-Test Passenger Dummy & Vehicle Interior - View 1

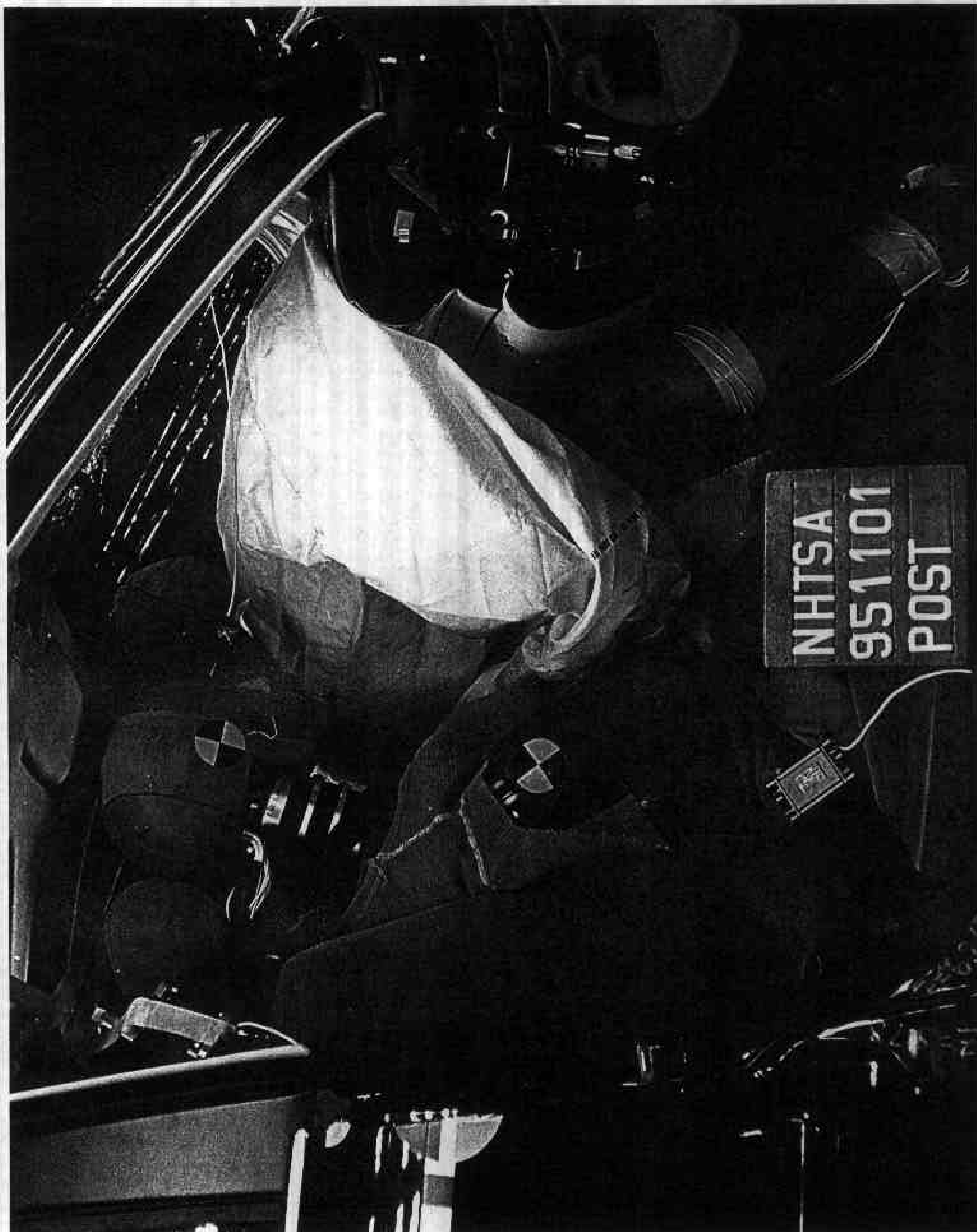


Figure A-32. Post-Test Passenger Dummy & Vehicle Interior - View 1

Figure A-33. Pre-Test Passenger Dummy & Vehicle Interior - View 2

Figure A-34. Post-Test Passenger Dummy & Vehicle Interior - View 2

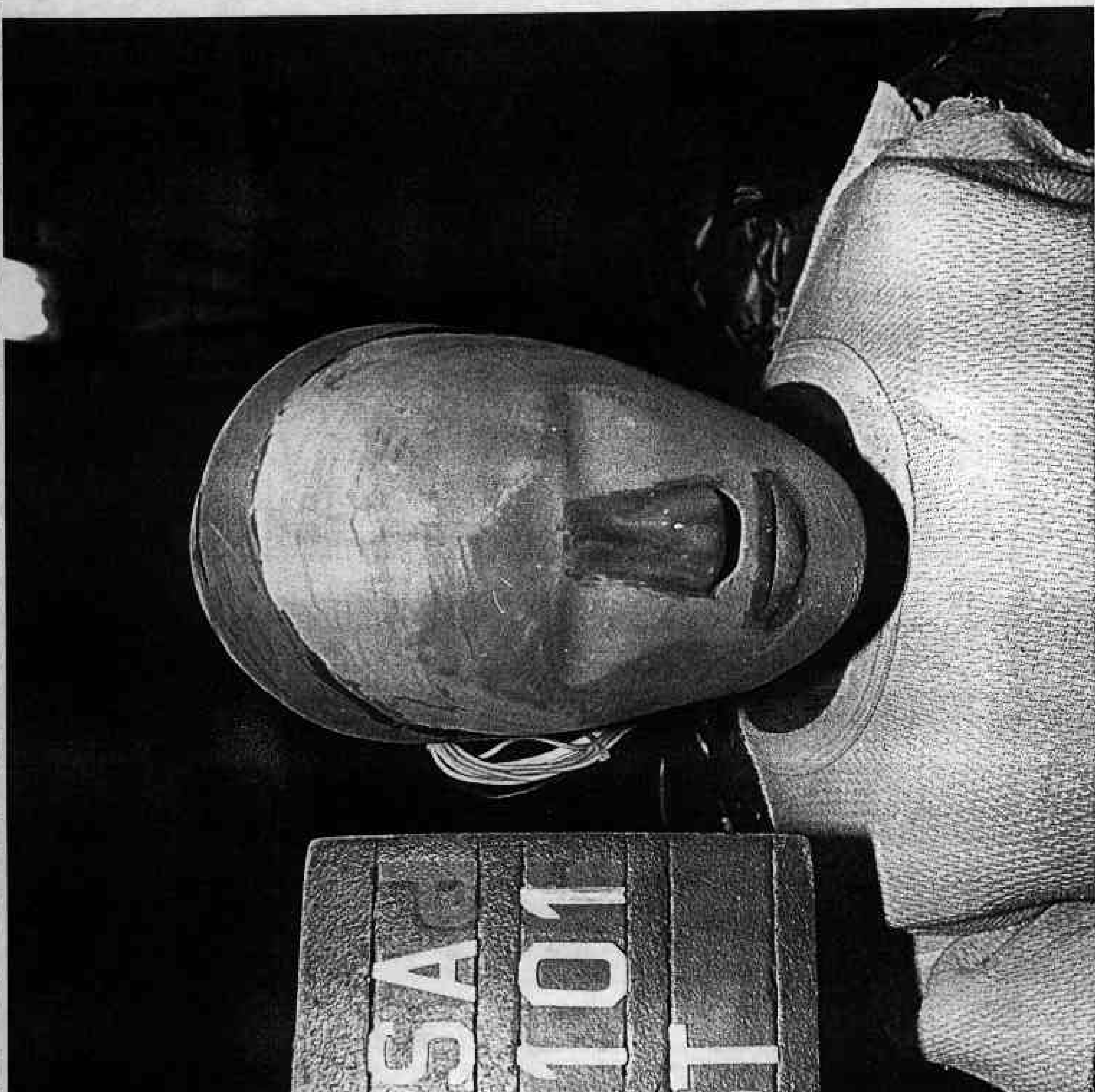


Figure A-35. Post-Test Driver Dummy Head Contact - View 1

Figure A-36. Post-Test Driver Dummy Head Contact - View 2

Figure A-37. Post-Test Driver Dummy Knee Contact - View 1

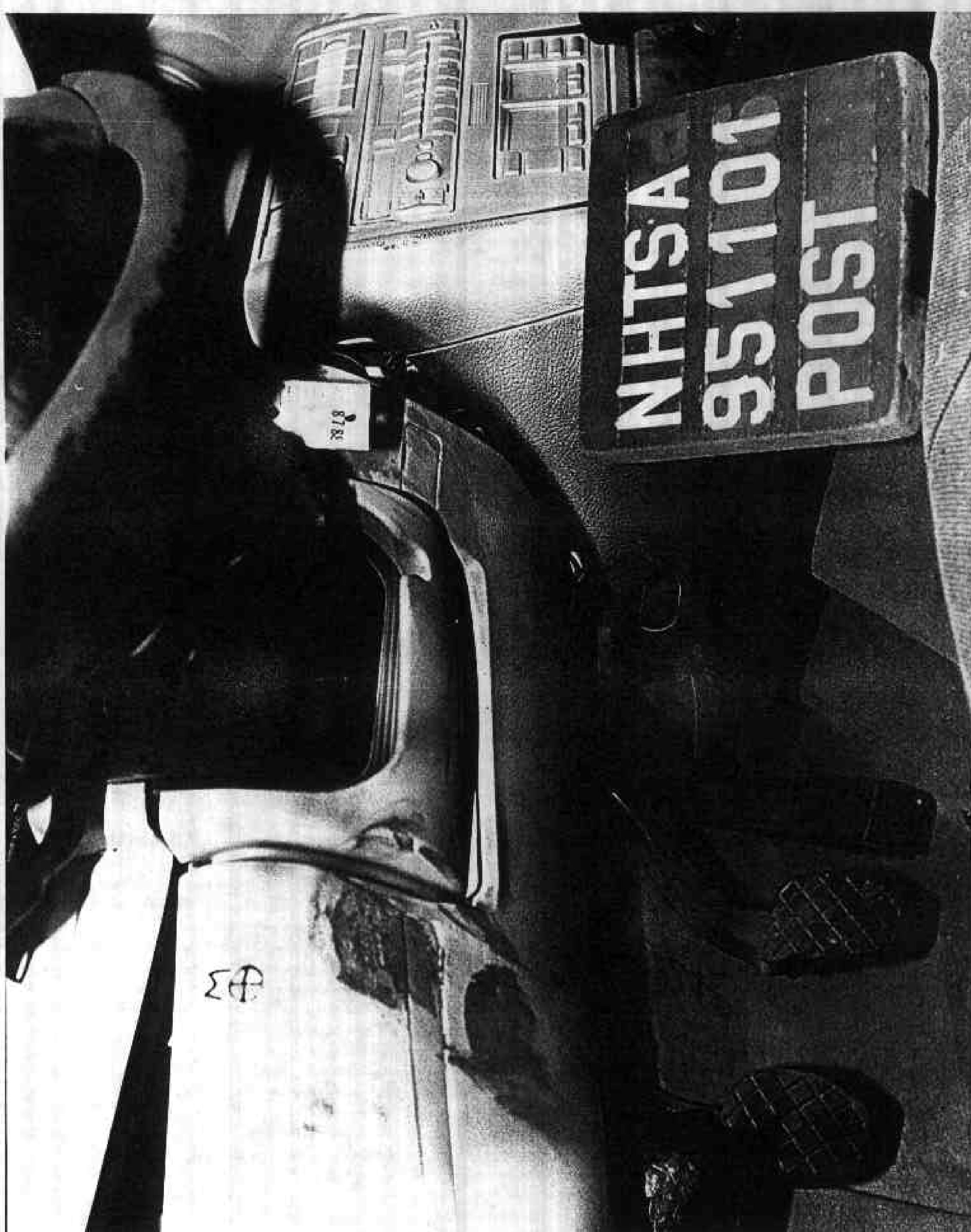


Figure A-38. Post-Test Driver Dummy Knee Contact - View 2

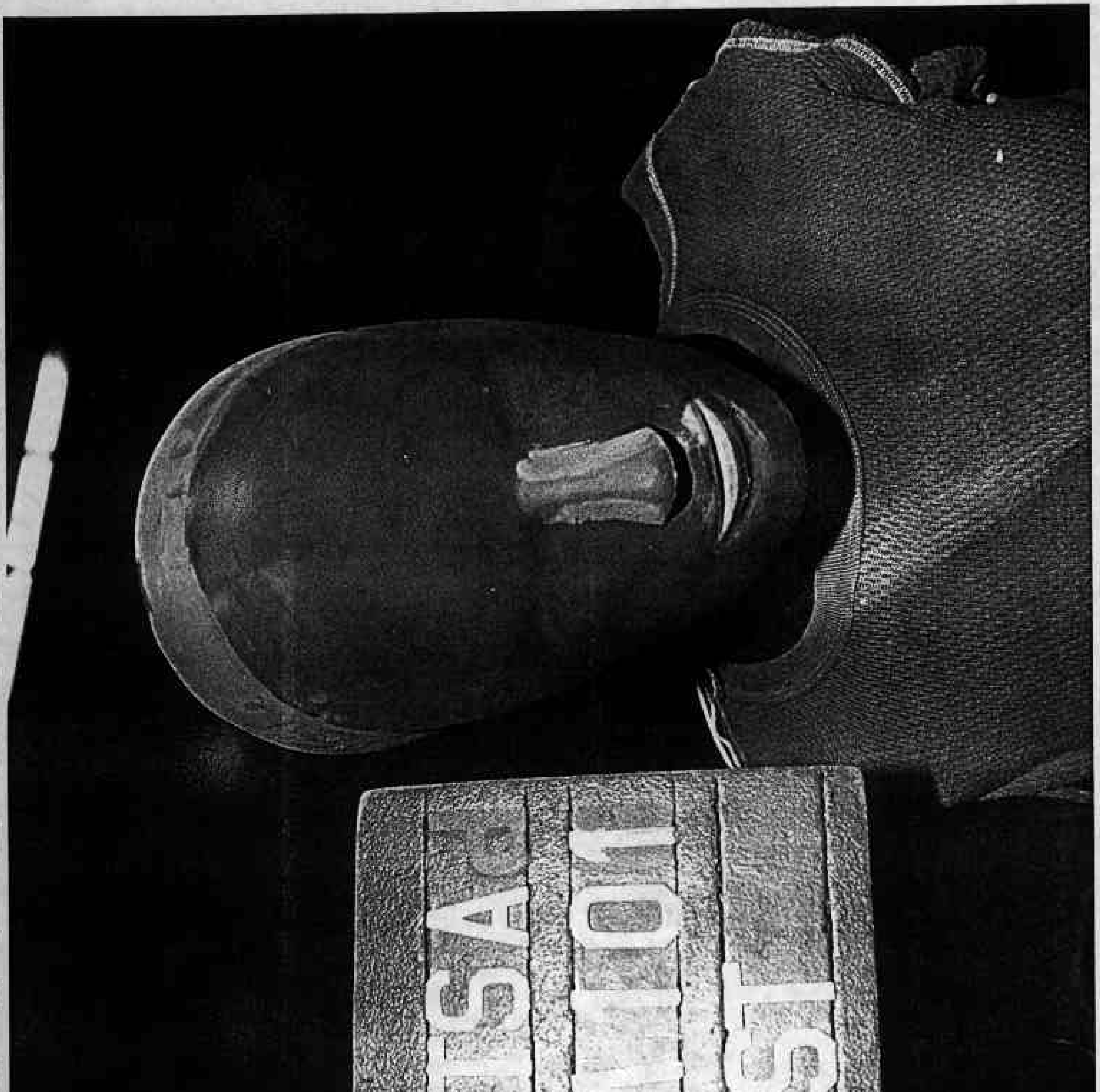


Figure A-39. Post-Test Passenger Dummy Head Contact - View 1

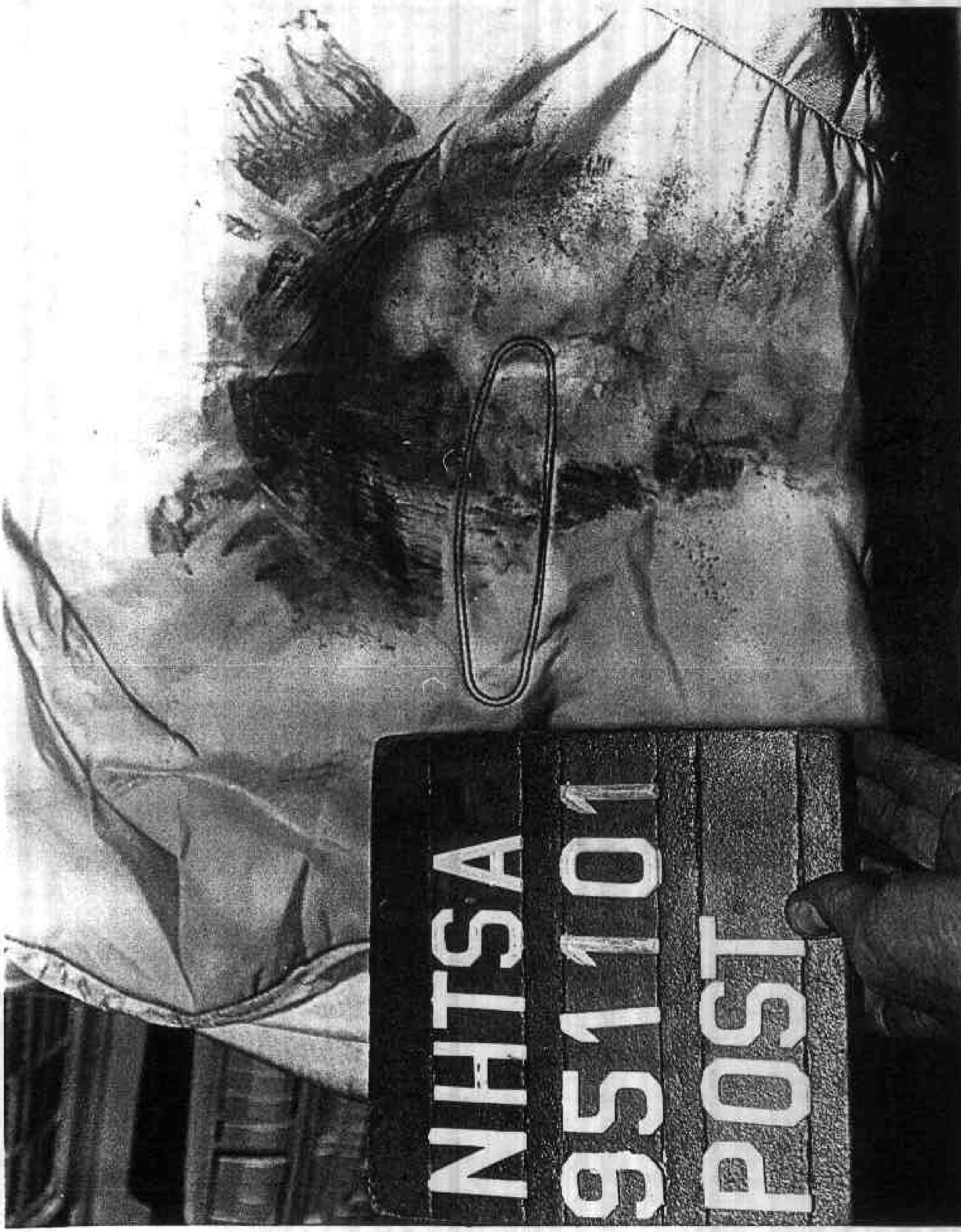


Figure A-40. Post-Test Passenger Dummy Head Contact - View 2

Figure A-41. Post-Test Passenger Dummy Knee Contact - View 1

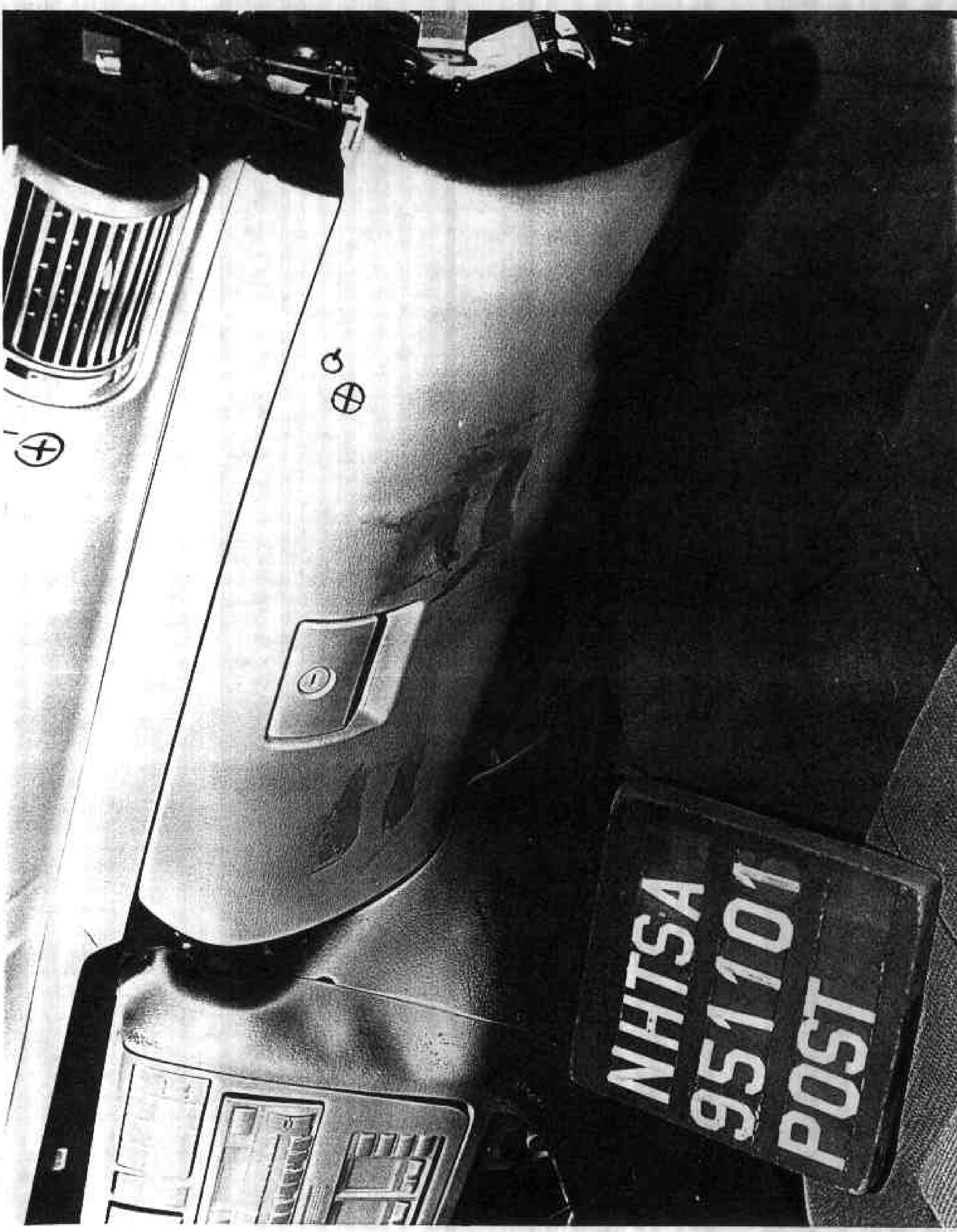


Figure A-42. Post-Test Passenger Dummy Knee Contact - View 2

Figure A-43. Pre-Test Vehicle Certification Label View

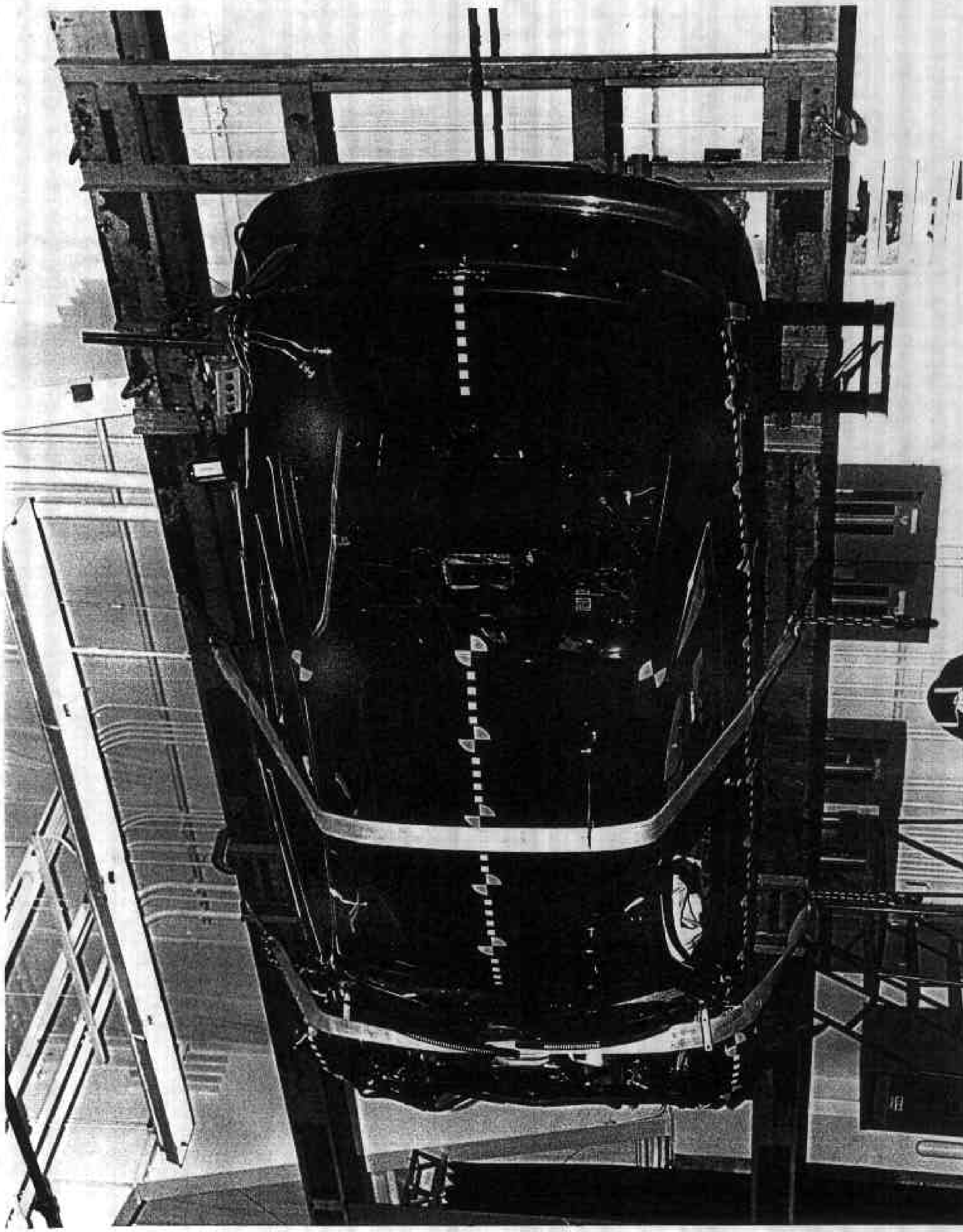


Figure A-44. Post-Test Vehicle on Static Rollover Machine View

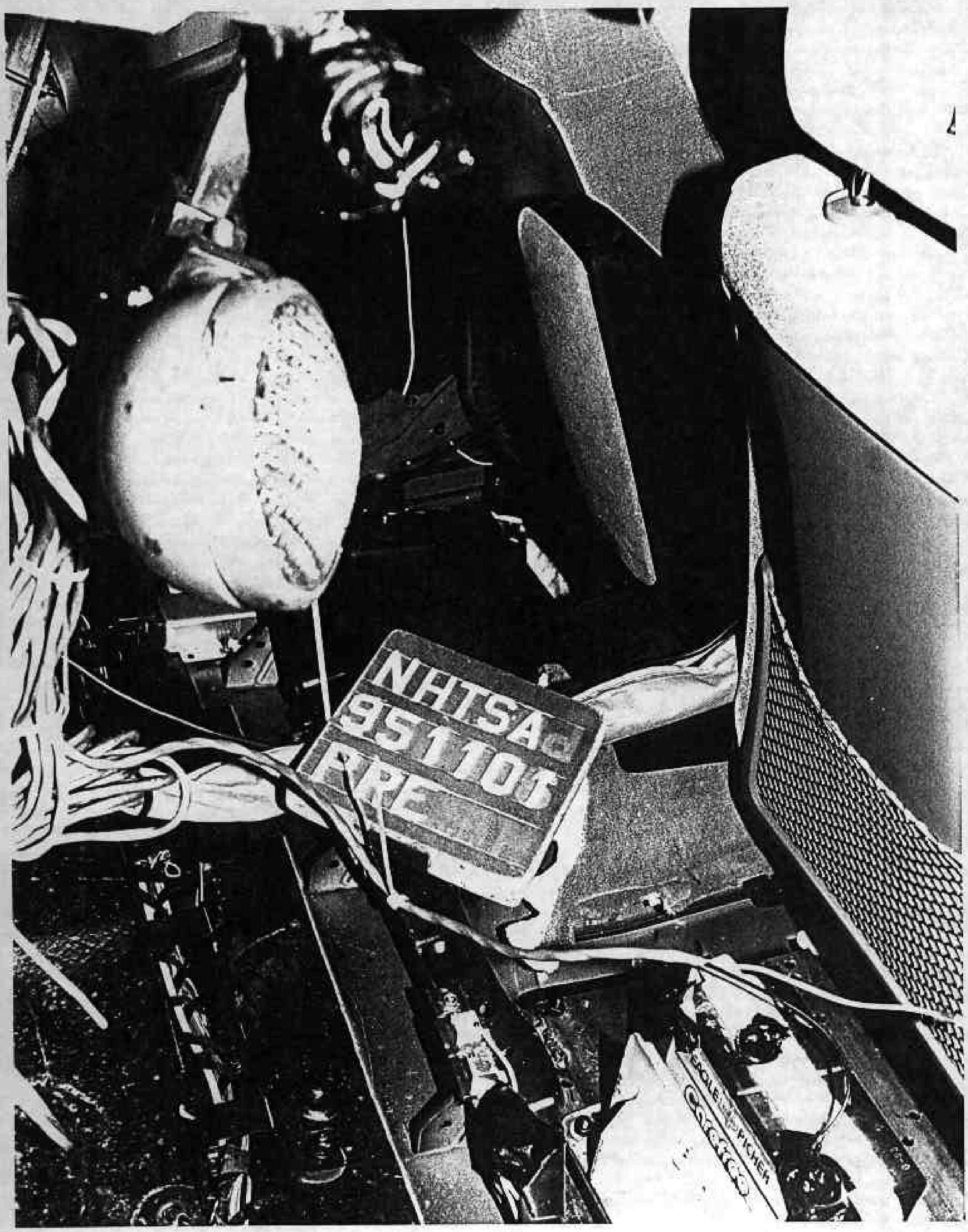
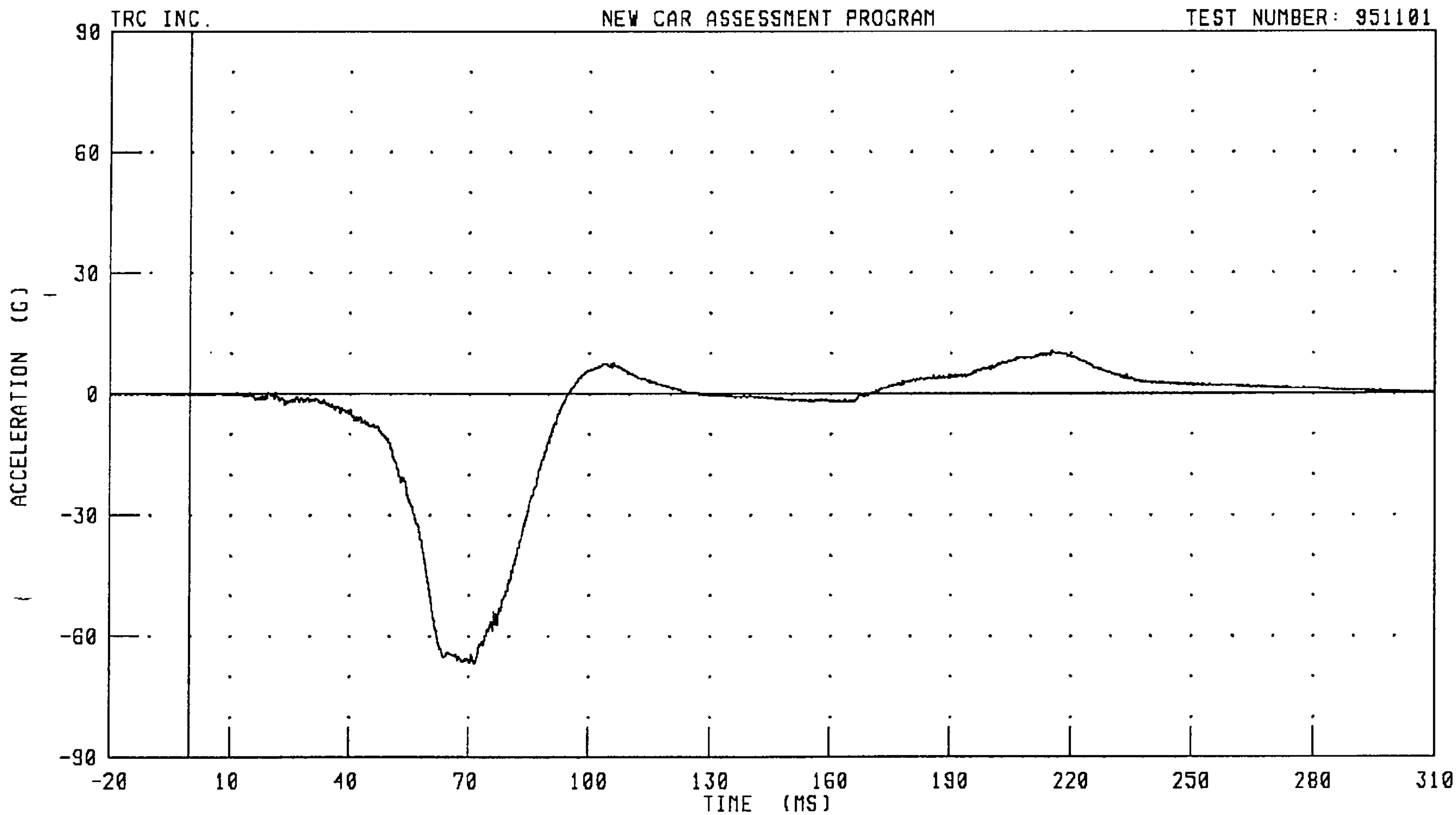


Figure A-45. Pre-Test Ballast Location View

Appendix B

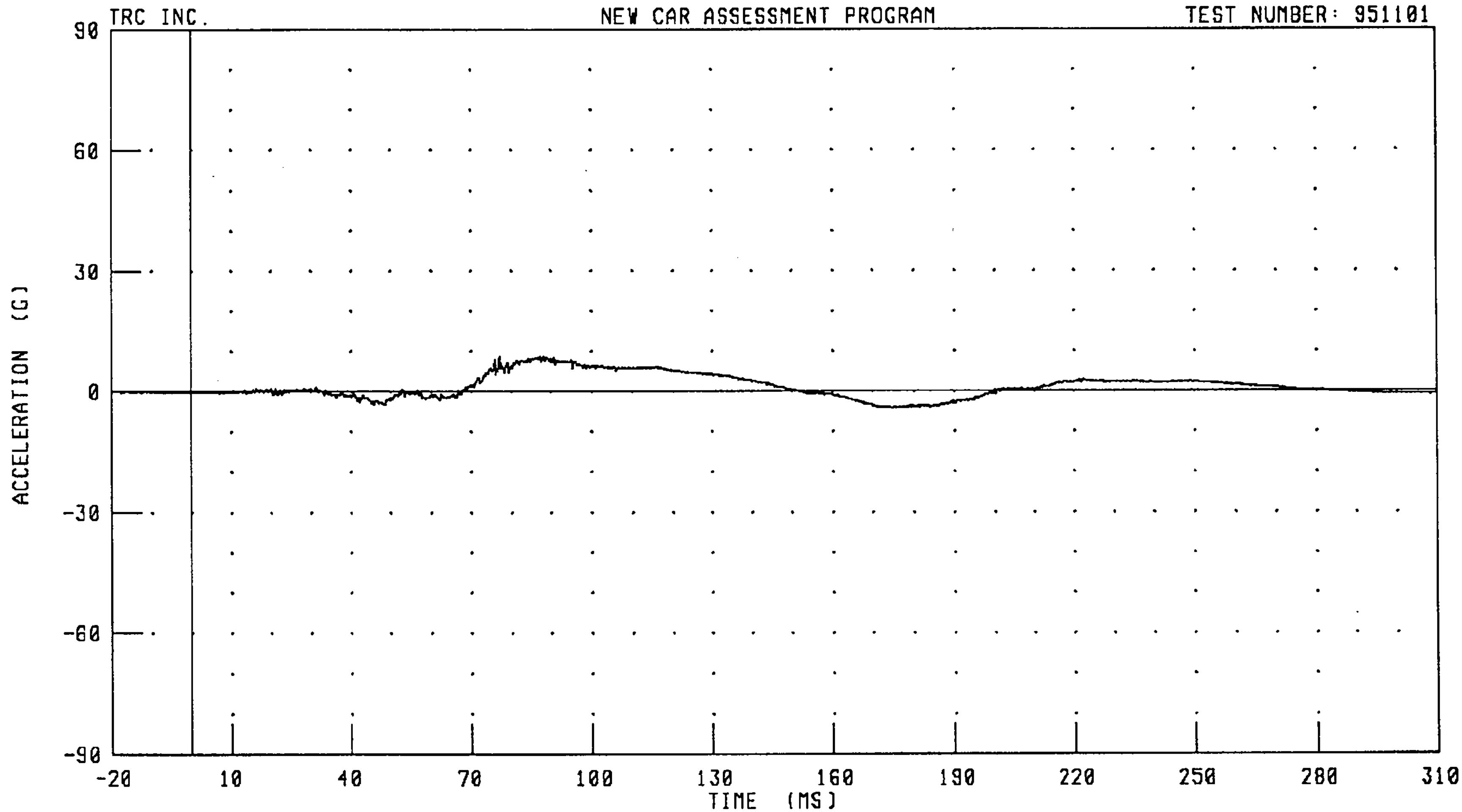
Data Plots

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

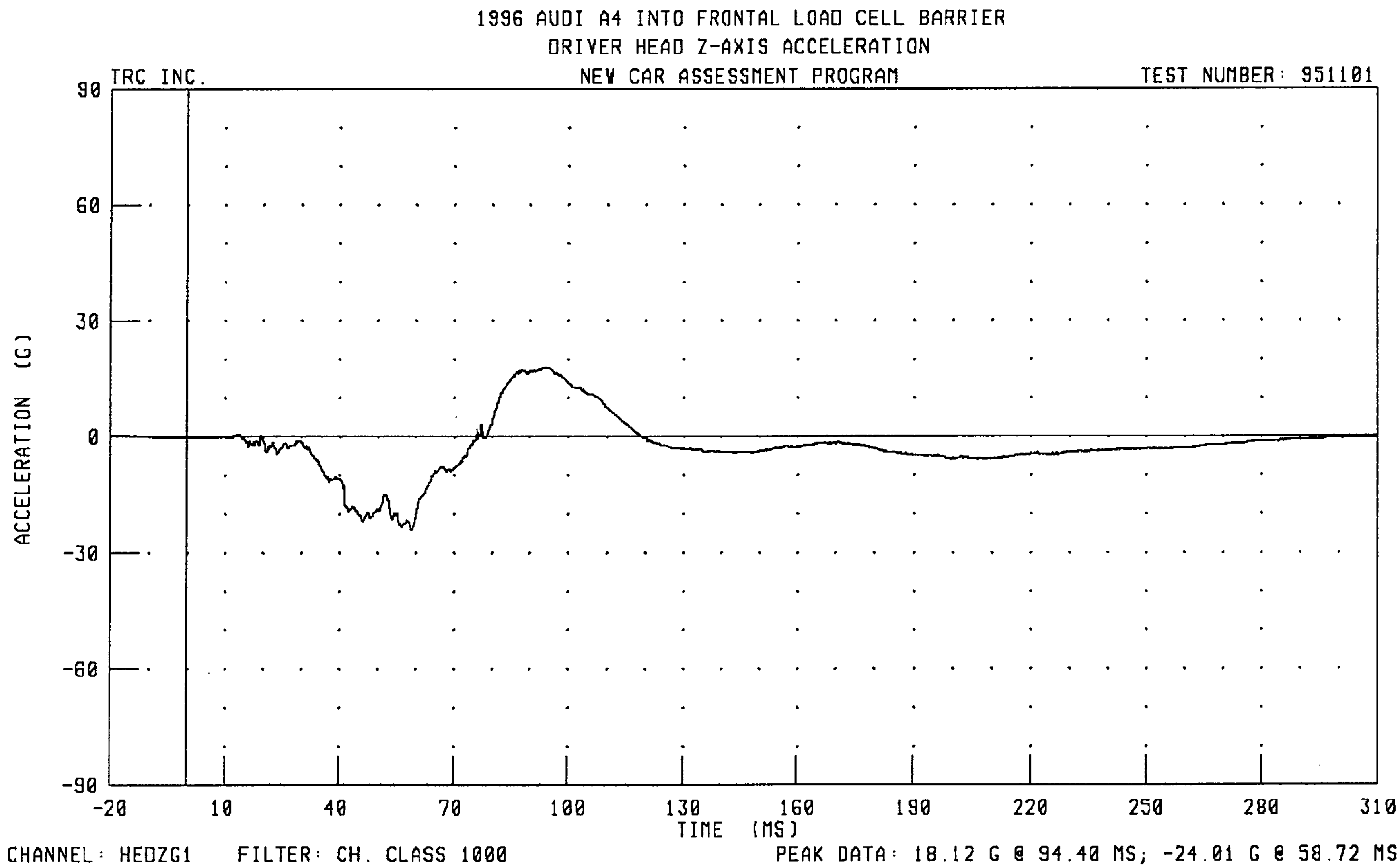


CHANNEL: HEDXG1 FILTER: CH. CLASS 1000 PEAK DATA: 10.60 G @ 215.20 MS; -66.70 G @ 71.52 MS

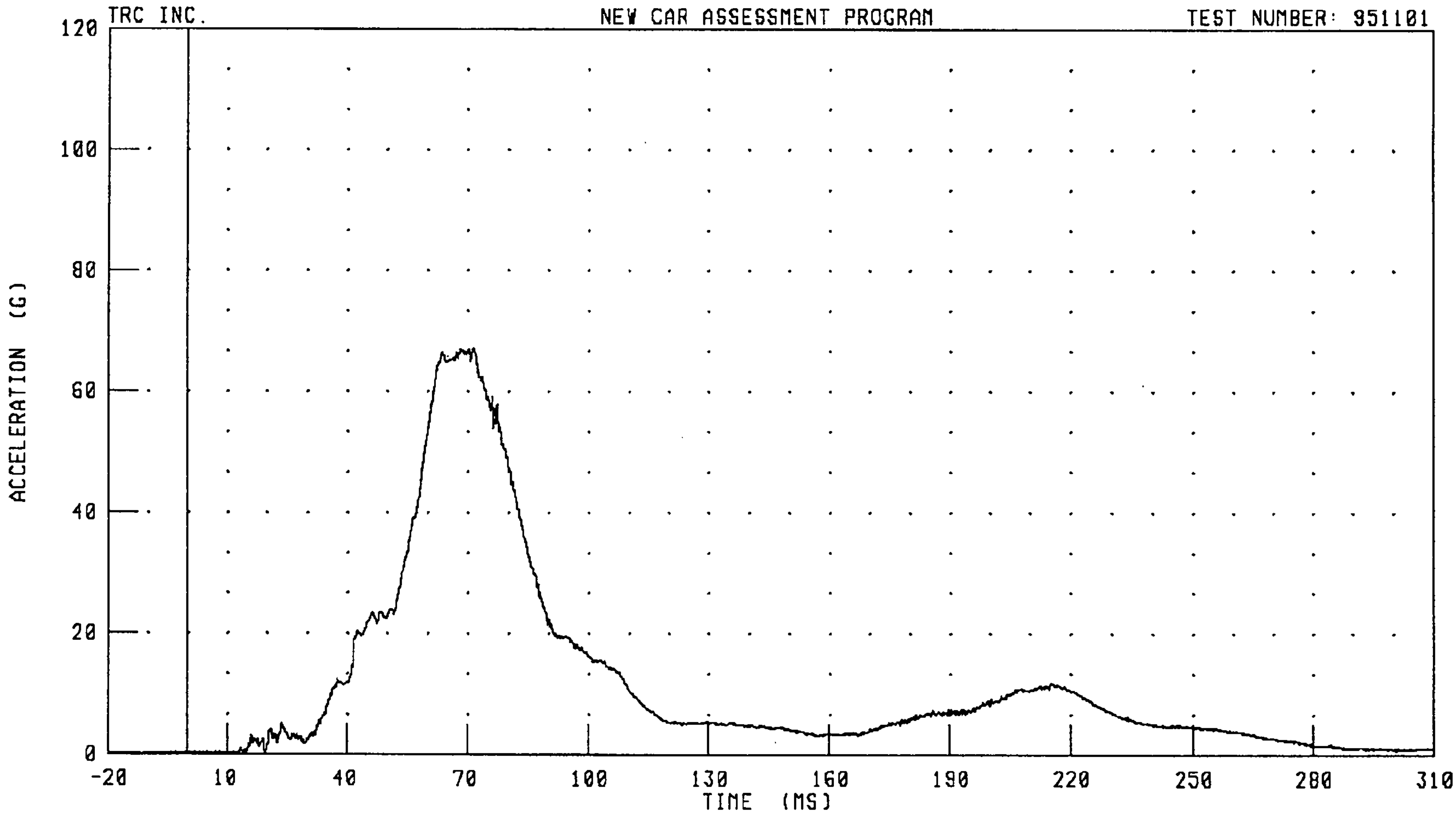
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD Y-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM



CHANNEL: HEDYG1 FILTER: CH. CLASS 1000 PEAK DATA: 8.65 G @ 77.28 MS; -4.37 G @ 174.64 MS

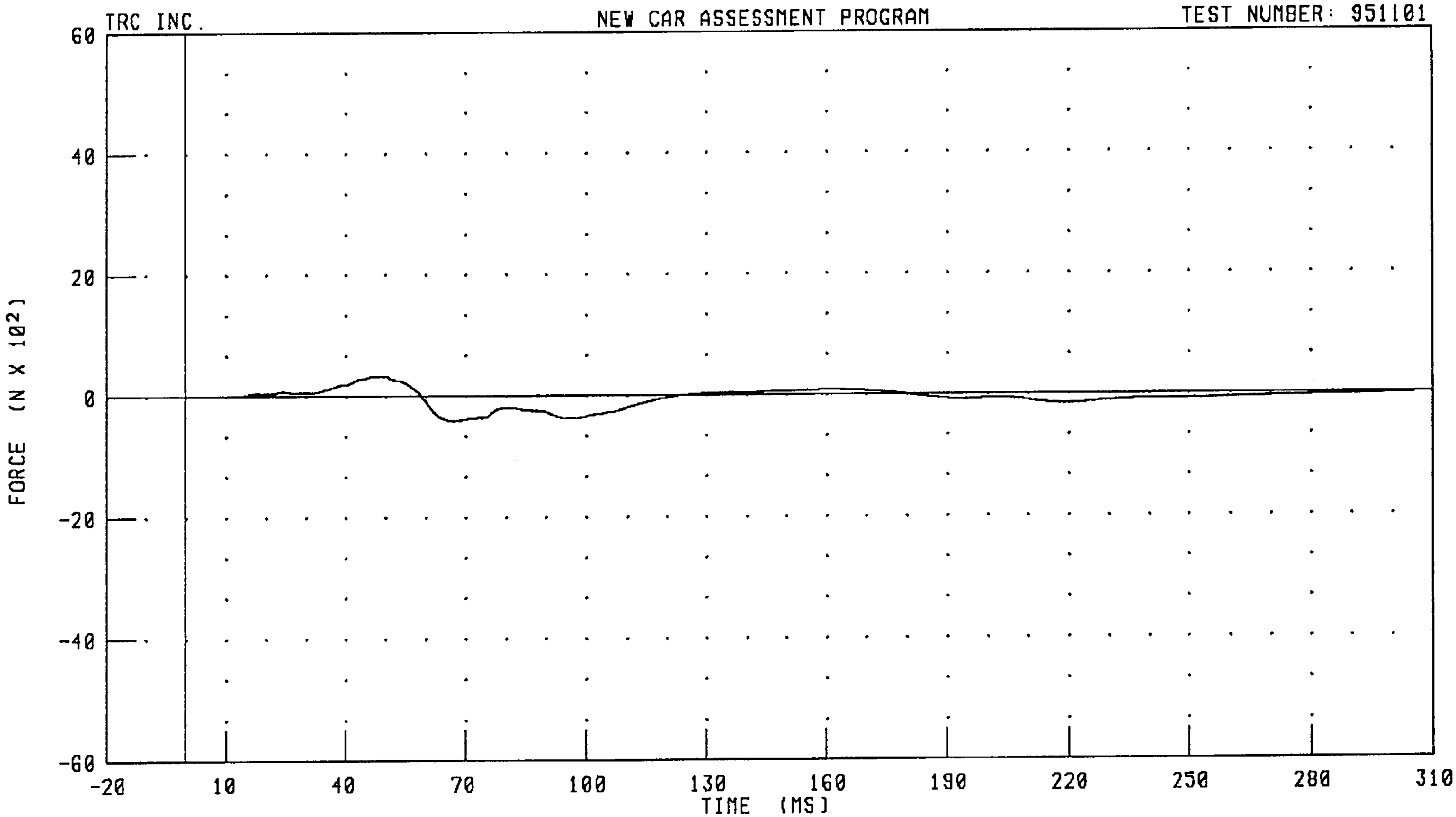

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD Z-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM
TRC INC.
TEST NUMBER: 951101
90
60
30
0
-30
-60
-90
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: HEDZG1
FILTER: CH. CLASS 1000
PEAK DATA: 18.12 G @ 94.40 MS; -24.01 G @ 58.72 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD RESULTANT ACCELERATION
NEW CAR ASSESSMENT PROGRAM



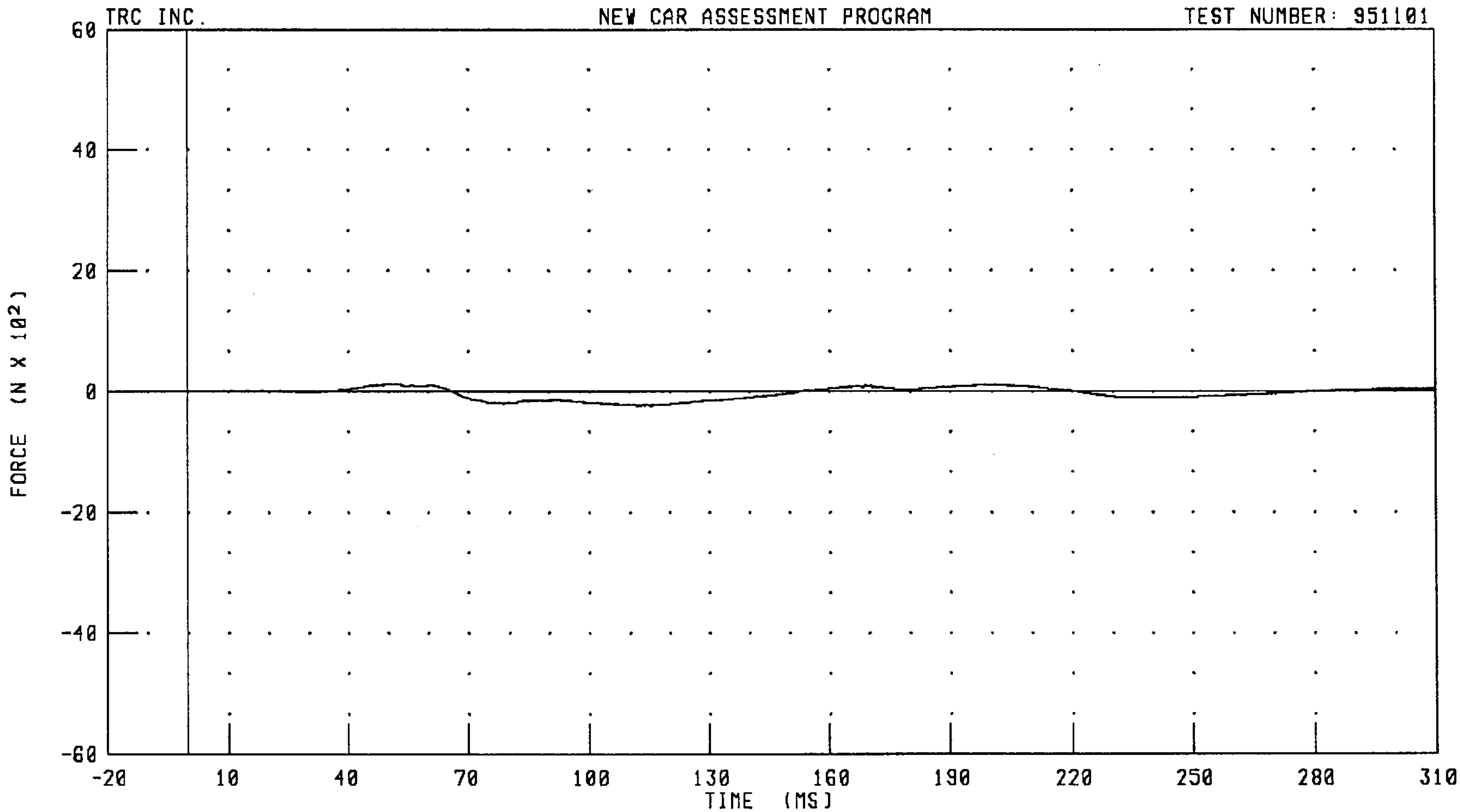
CHANNEL: HEDRG1 FILTER: CH. CLASS 1000 PEAK DATA: 67.10 G @ 71.52 MS; 0.04 G @ -19.28 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK X-AXIS SHEAR FORCE
NEW CAR ASSESSMENT PROGRAM



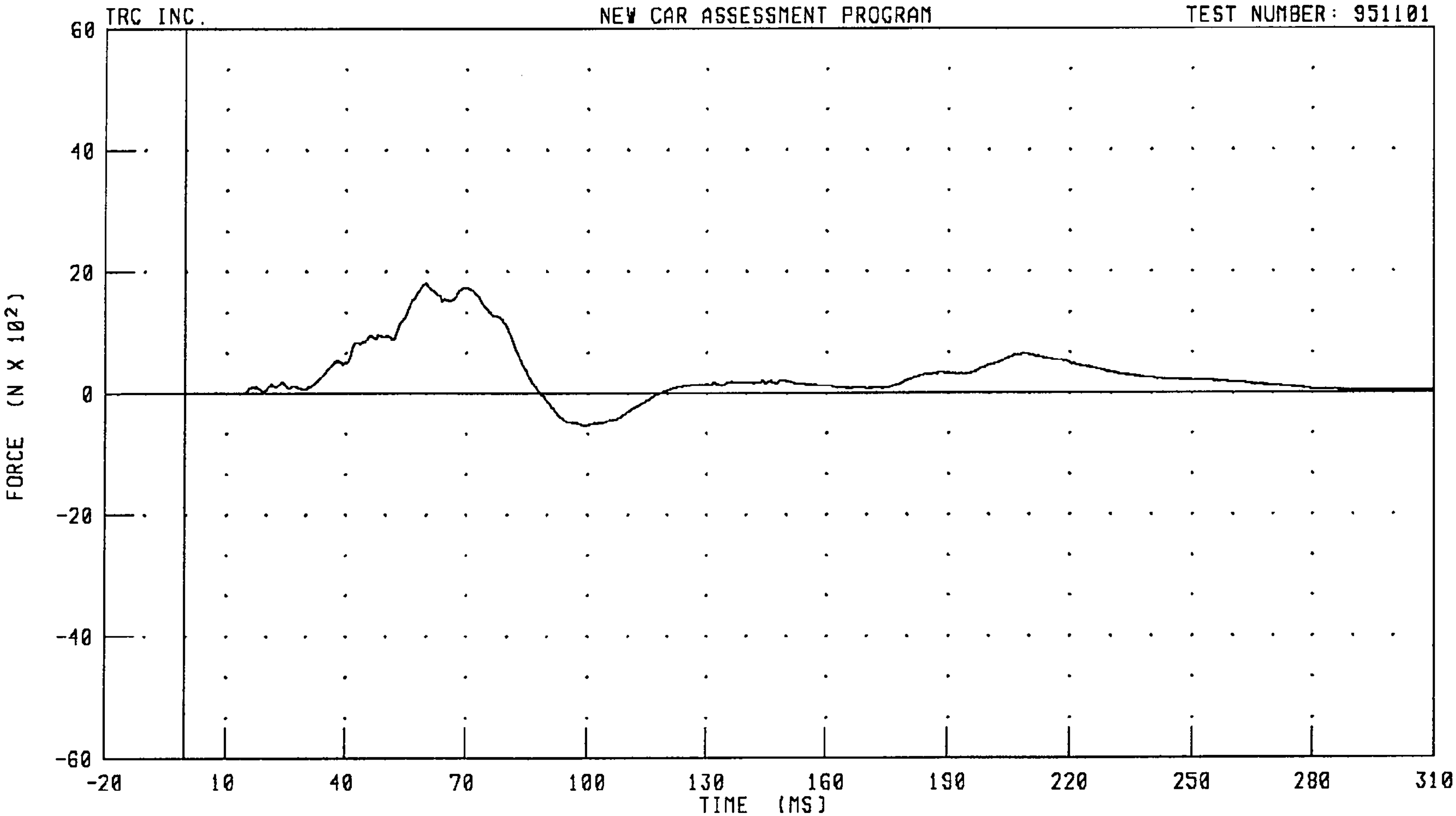
CHANNEL: NEKXF1 FILTER: CH. CLASS 1000 PEAK DATA: 327.68 N @ 48.32 MS; -415.67 N @ 66.88 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK Y-AXIS SHEAR FORCE
NEW CAR ASSESSMENT PROGRAM



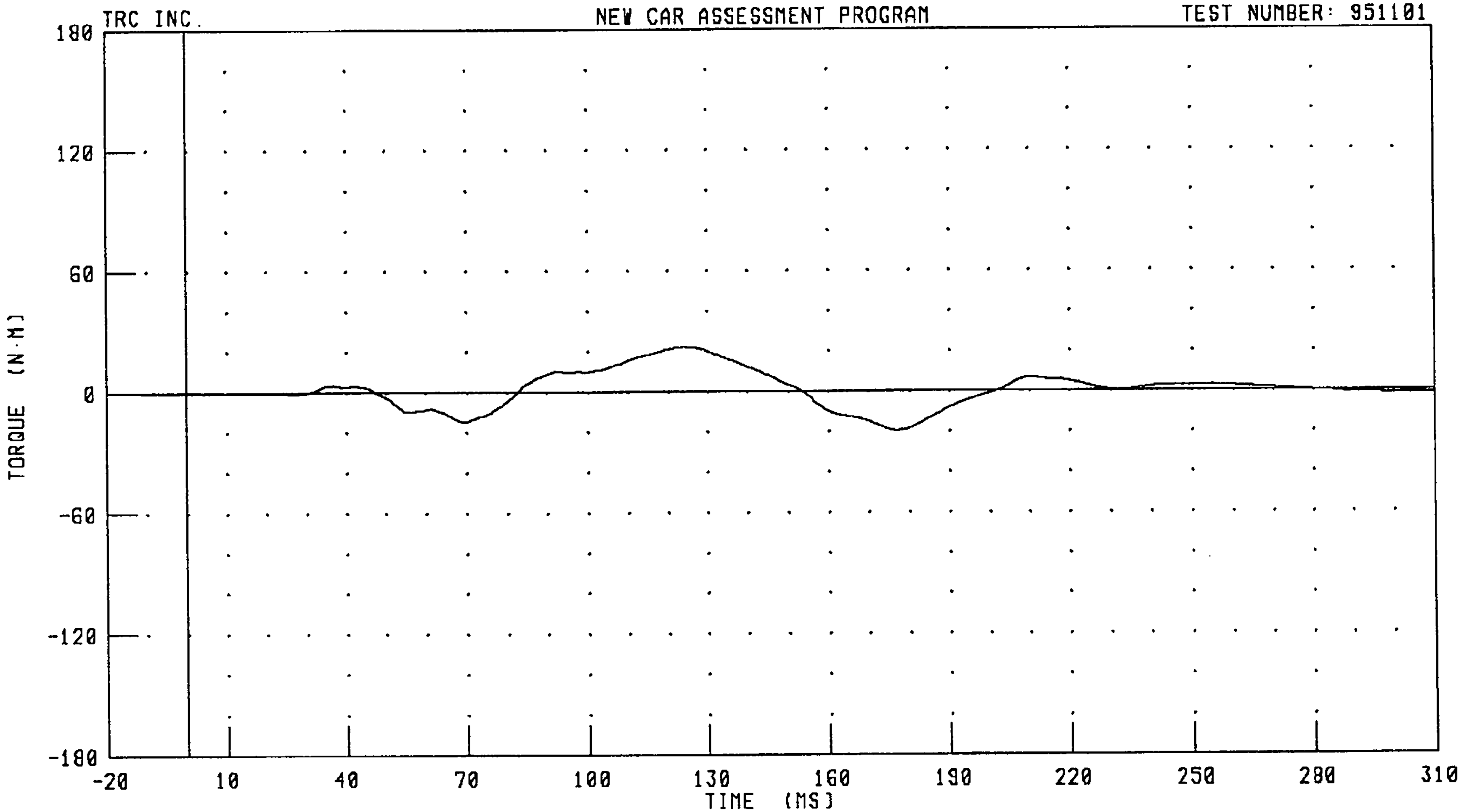
CHANNEL: NEKYF1 FILTER: CH. CLASS 1000 PEAK DATA: 127.24 N @ 50.32 MS; -229.45 N @ 112.00 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK Z-AXIS AXIAL FORCE
NEW CAR ASSESSMENT PROGRAM



CHANNEL: NEKZF1 FILTER: CH. CLASS 1000 PEAK DATA: 1807.24 N @ 59.92 MS; -534.06 N @ 99.12 MS

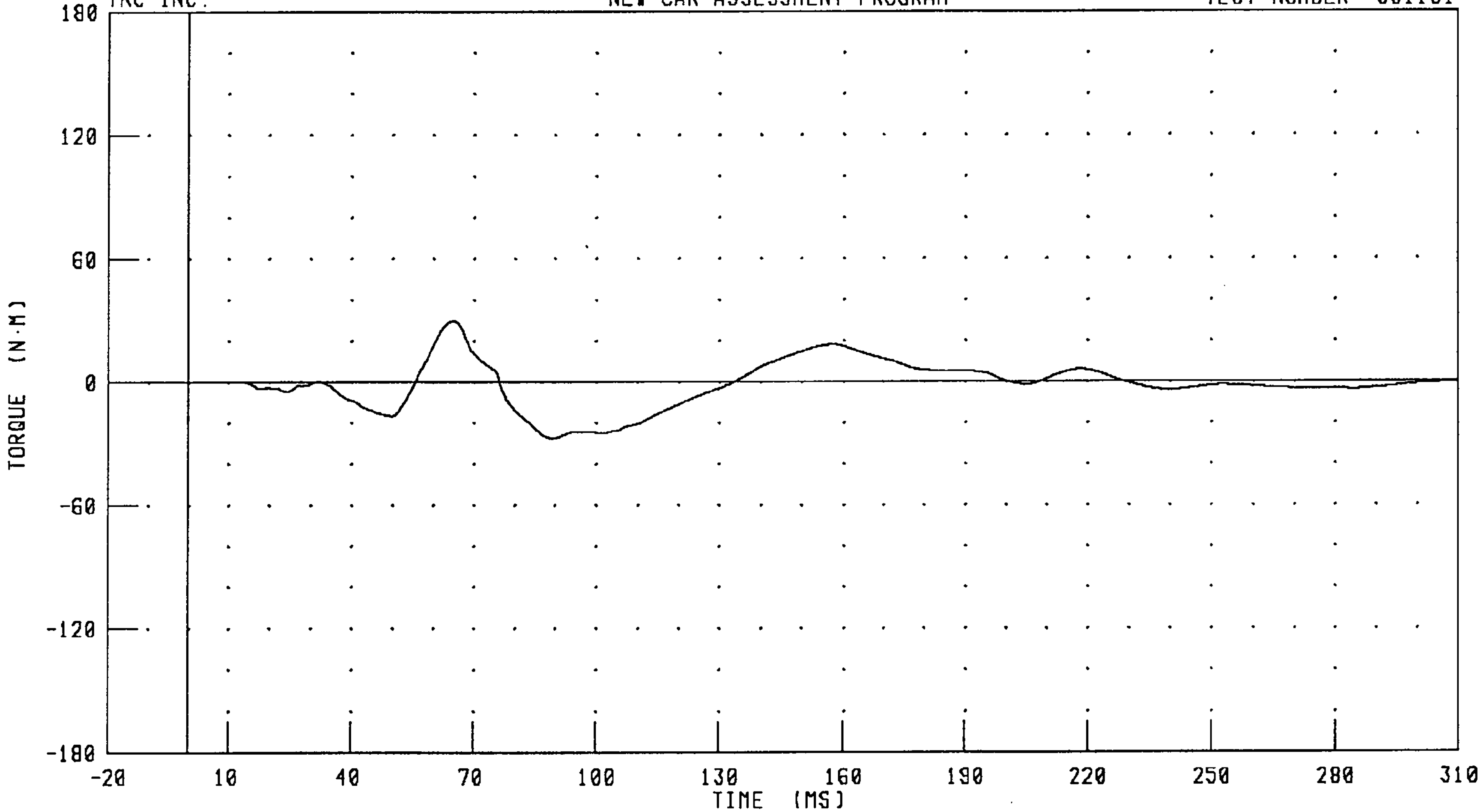
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK MOMENT ABOUT X AXIS
NEW CAR ASSESSMENT PROGRAM



CHANNEL: NEKXM1 FILTER: CH. CLASS 600 PEAK DATA: 22.18 N·M @ 124.00 MS; -19.62 N·M @ 176.72 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK MOMENT ABOUT Y AXIS
NEW CAR ASSESSMENT PROGRAM

TRC INC. TEST NUMBER: 951101

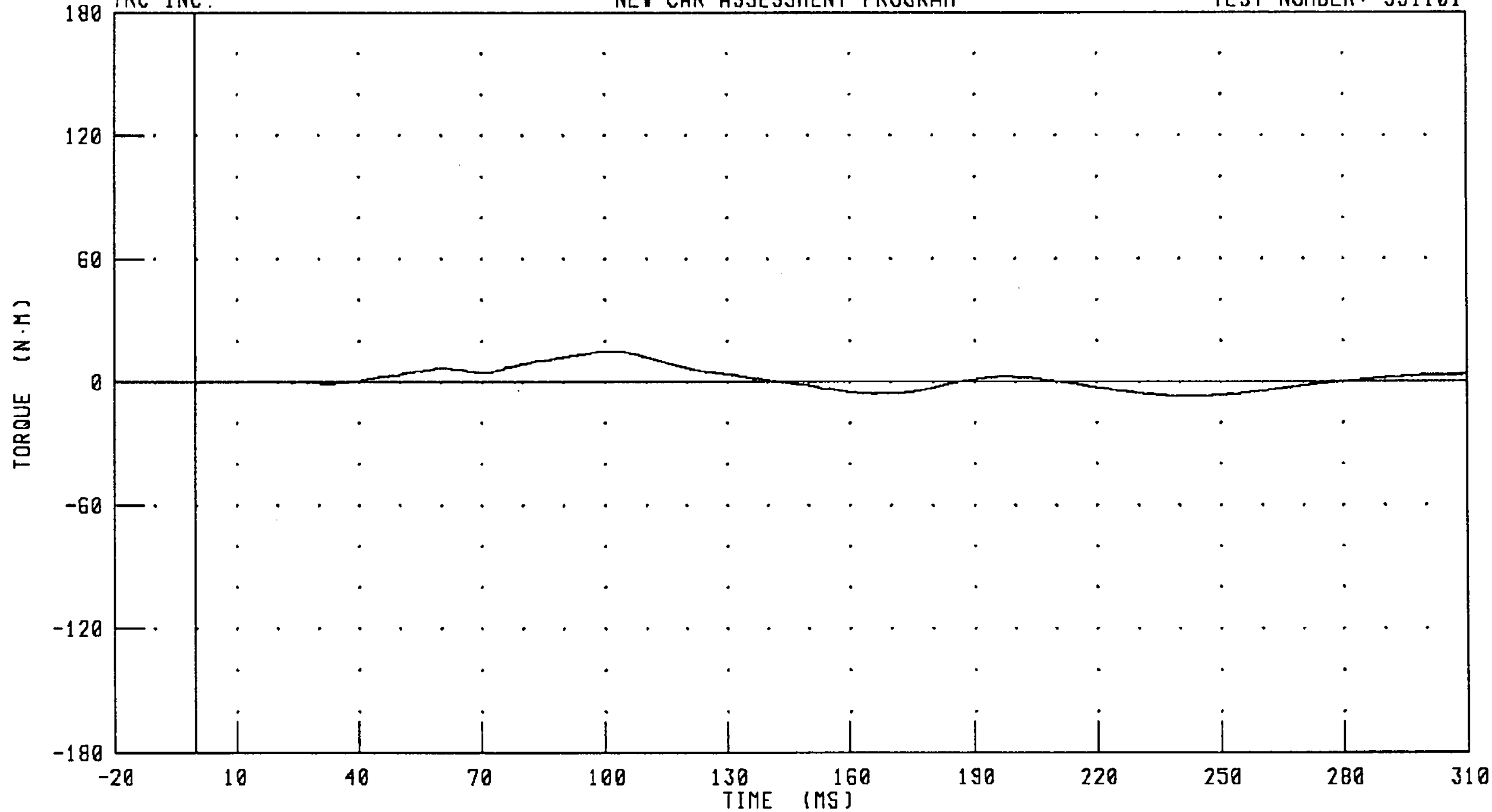


CHANNEL: NEKYM1 FILTER: CH. CLASS 600 PEAK DATA: 29.75 N·M @ 65.04 MS; -27.54 N·M @ 89.52 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK MOMENT ABOUT Z AXIS
NEW CAR ASSESSMENT PROGRAM

TRC INC.

TEST NUMBER: 951101



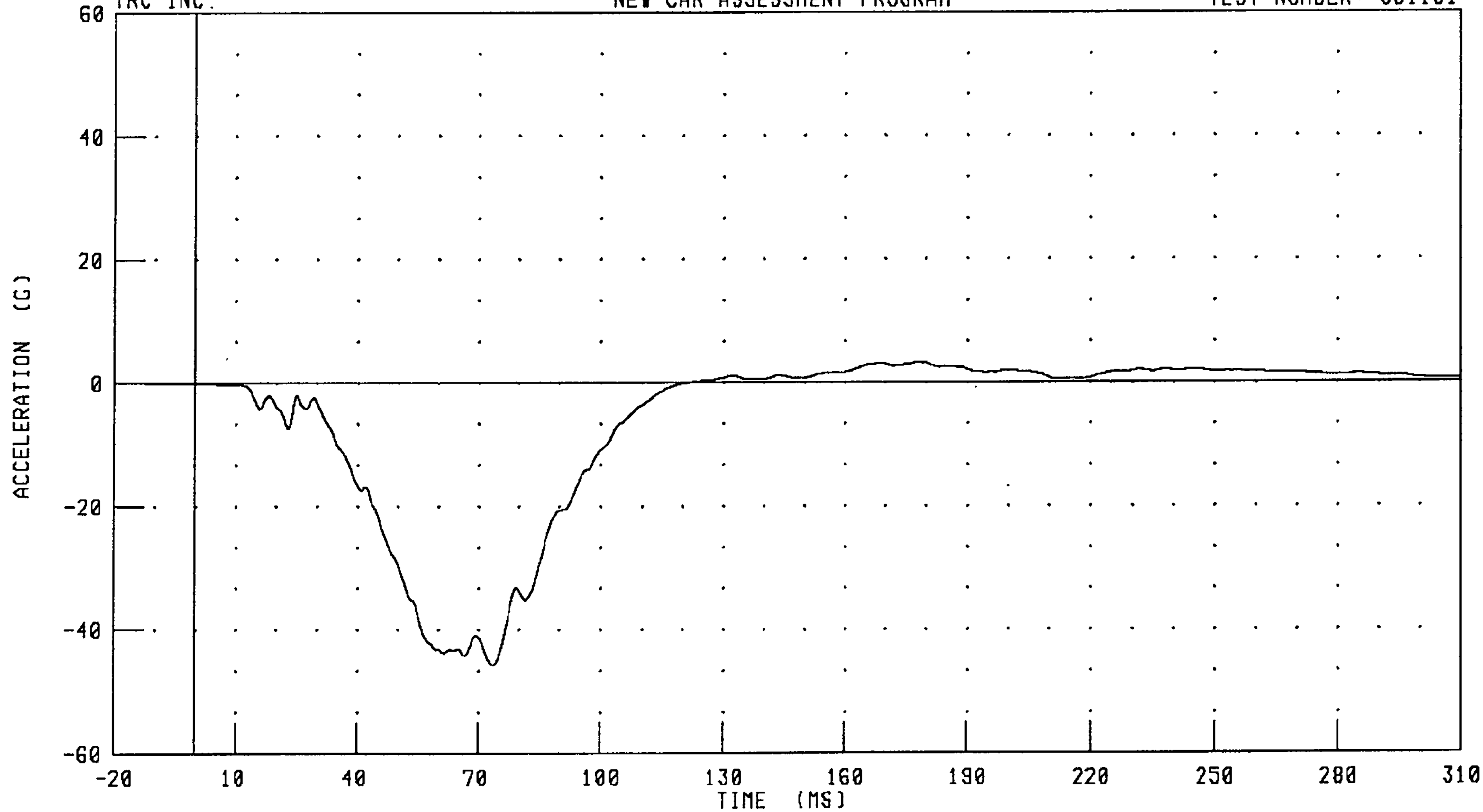
CHANNEL: NEKZM1 FILTER: CH. CLASS 600

PEAK DATA: 15.01 N·M @ 101.04 MS; -7.13 N·M @ 243.20 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TRC INC.

TEST NUMBER: 951101

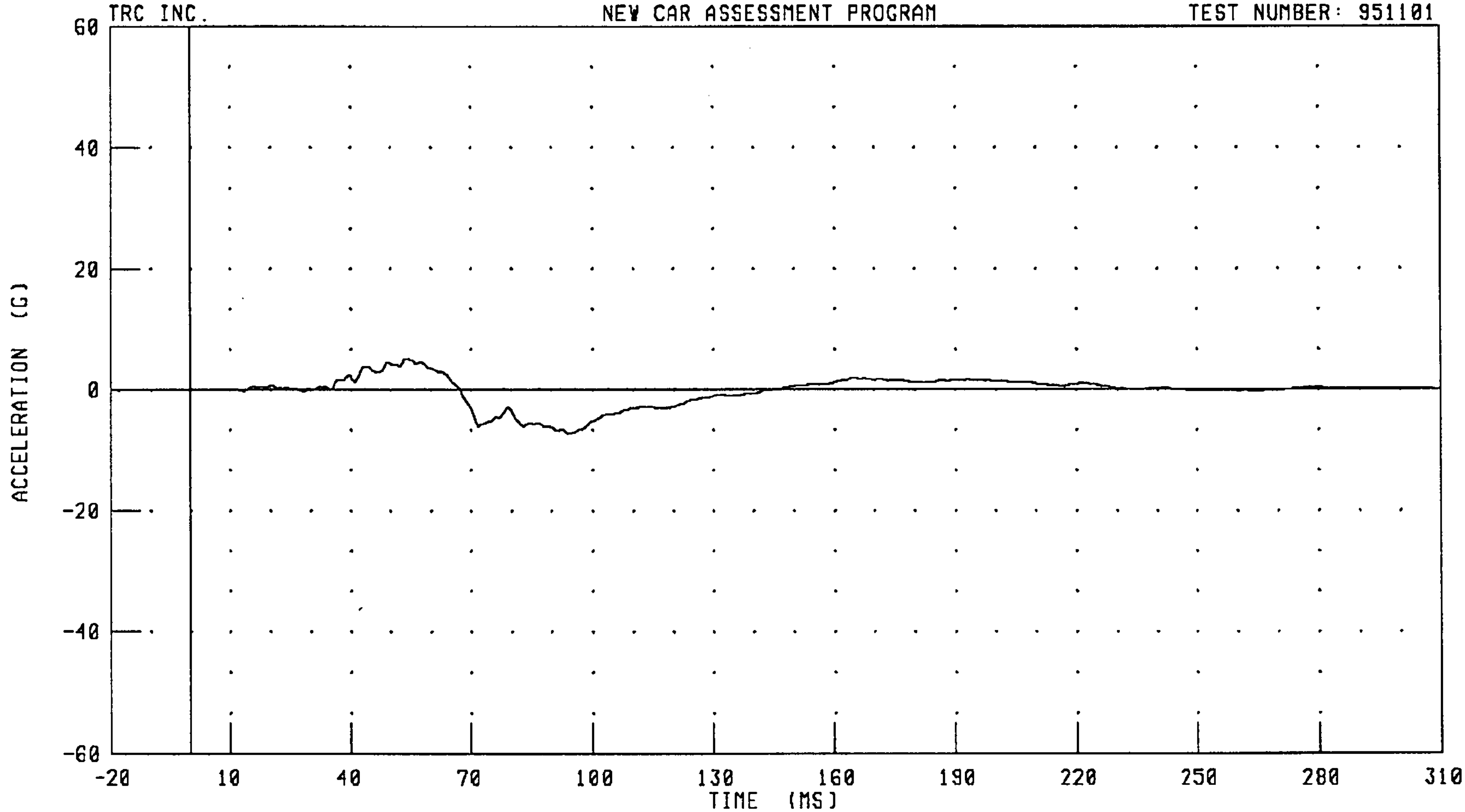


CHANNEL: CSTXG1 FILTER: CH. CLASS 180

PEAK DATA: 3.23 G @ 178.00 MS; -45.79 G @ 73.68 MS

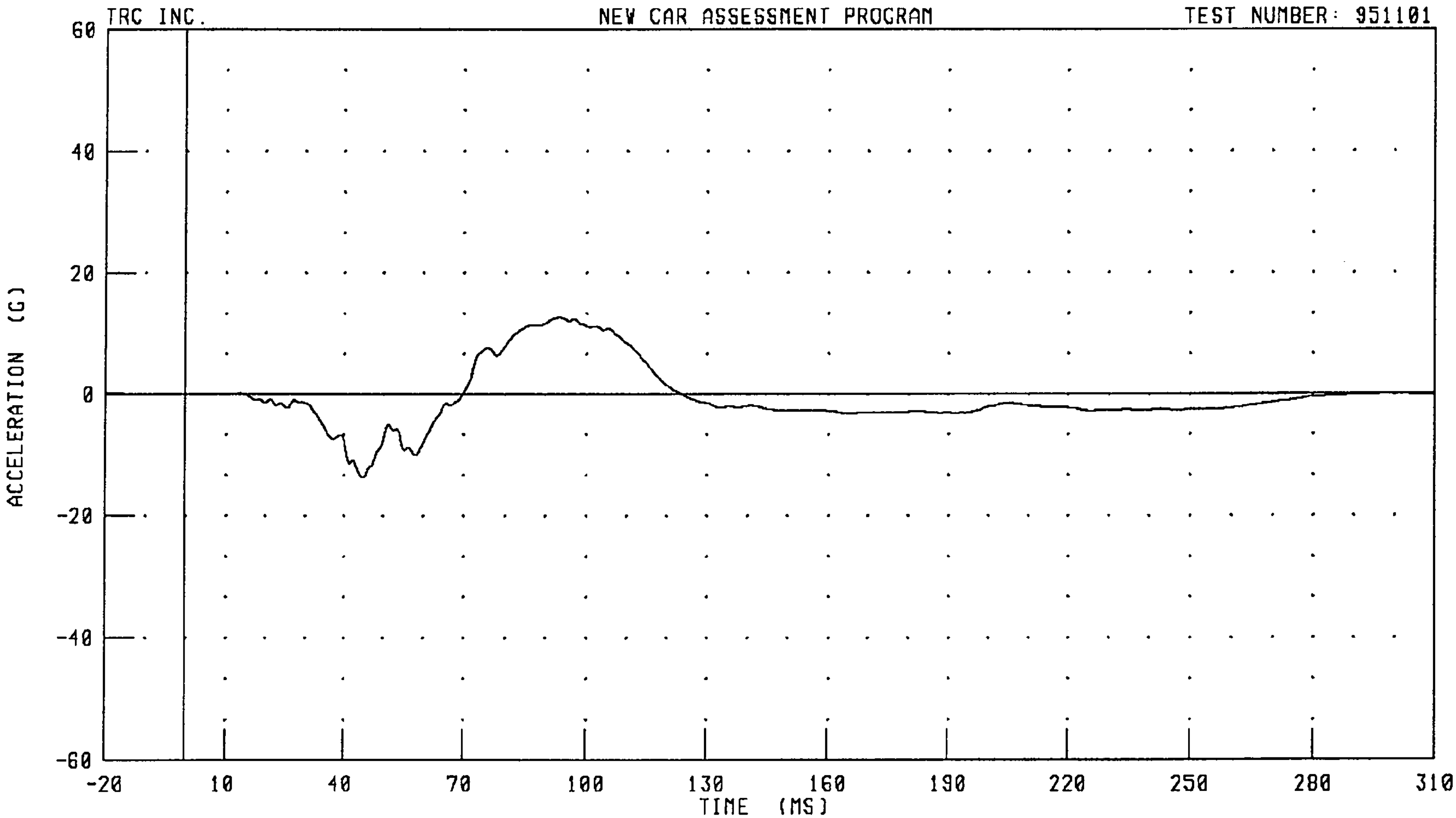
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST Y-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TRC INC. TEST NUMBER: 951101



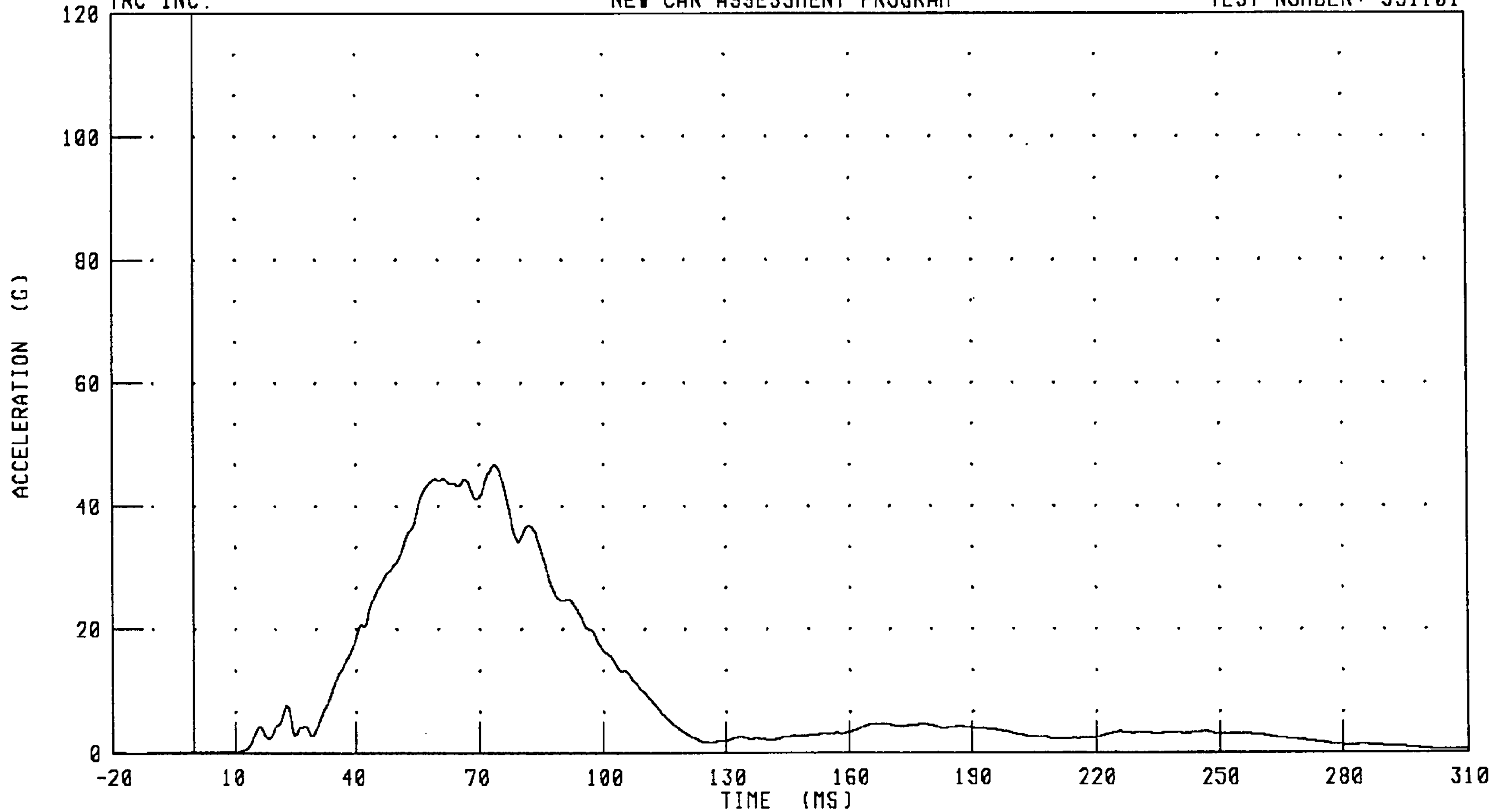
CHANNEL: CSTYG1 FILTER: CH. CLASS 180 PEAK DATA: 5.13 G @ 53.92 MS; -7.34 G @ 94.32 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST Z-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM



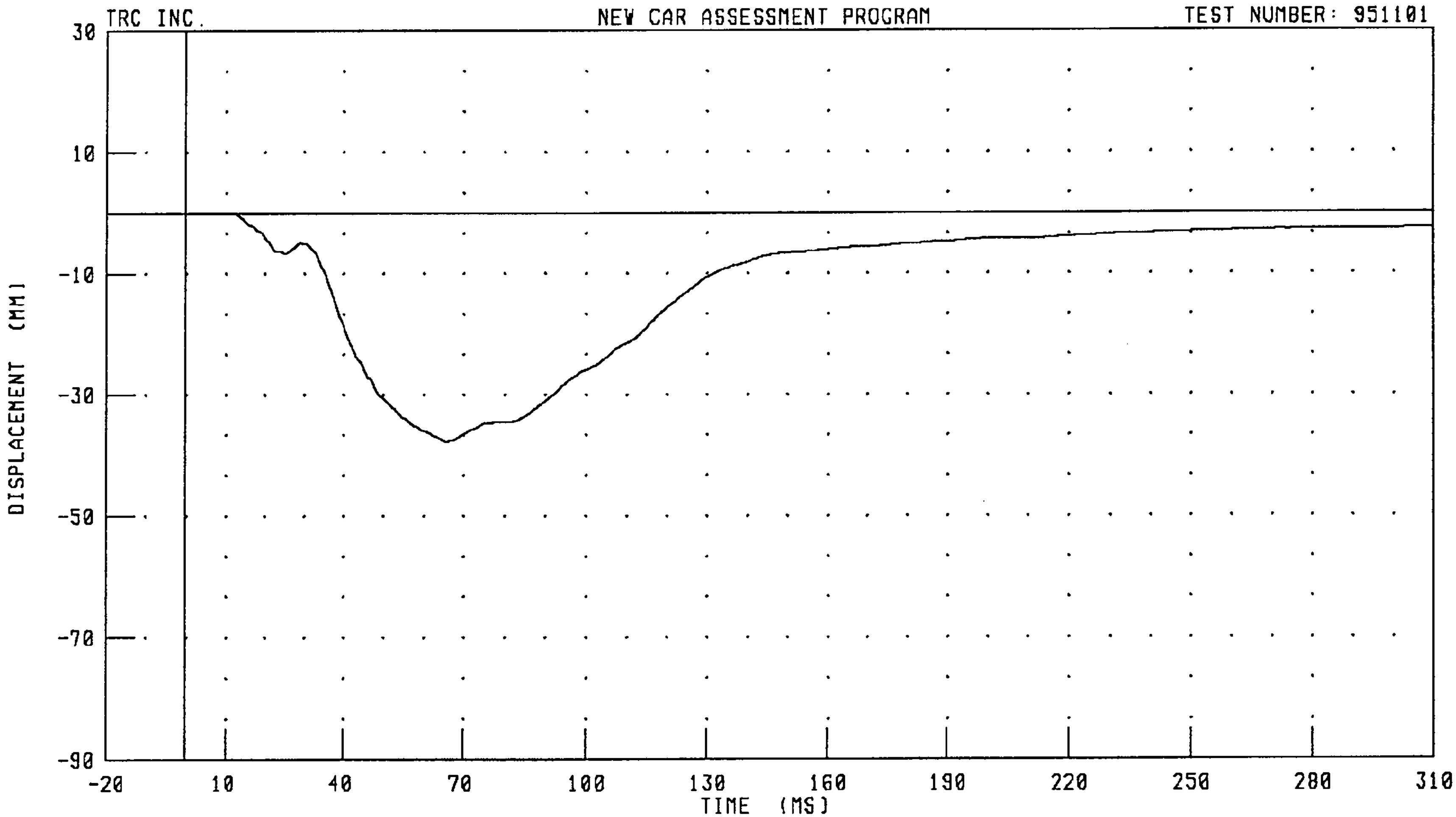
CHANNEL: CSTZG1 FILTER: CH. CLASS 180 PEAK DATA: 12.63 G @ 93.12 MS; -13.75 G @ 44.96 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST RESULTANT ACCELERATION
NEW CAR ASSESSMENT PROGRAM



CHANNEL: CSTRG1 FILTER: CH. CLASS 180 PEAK DATA: 46.60 G @ 73.68 MS; 0.01 G @ -20.00 MS

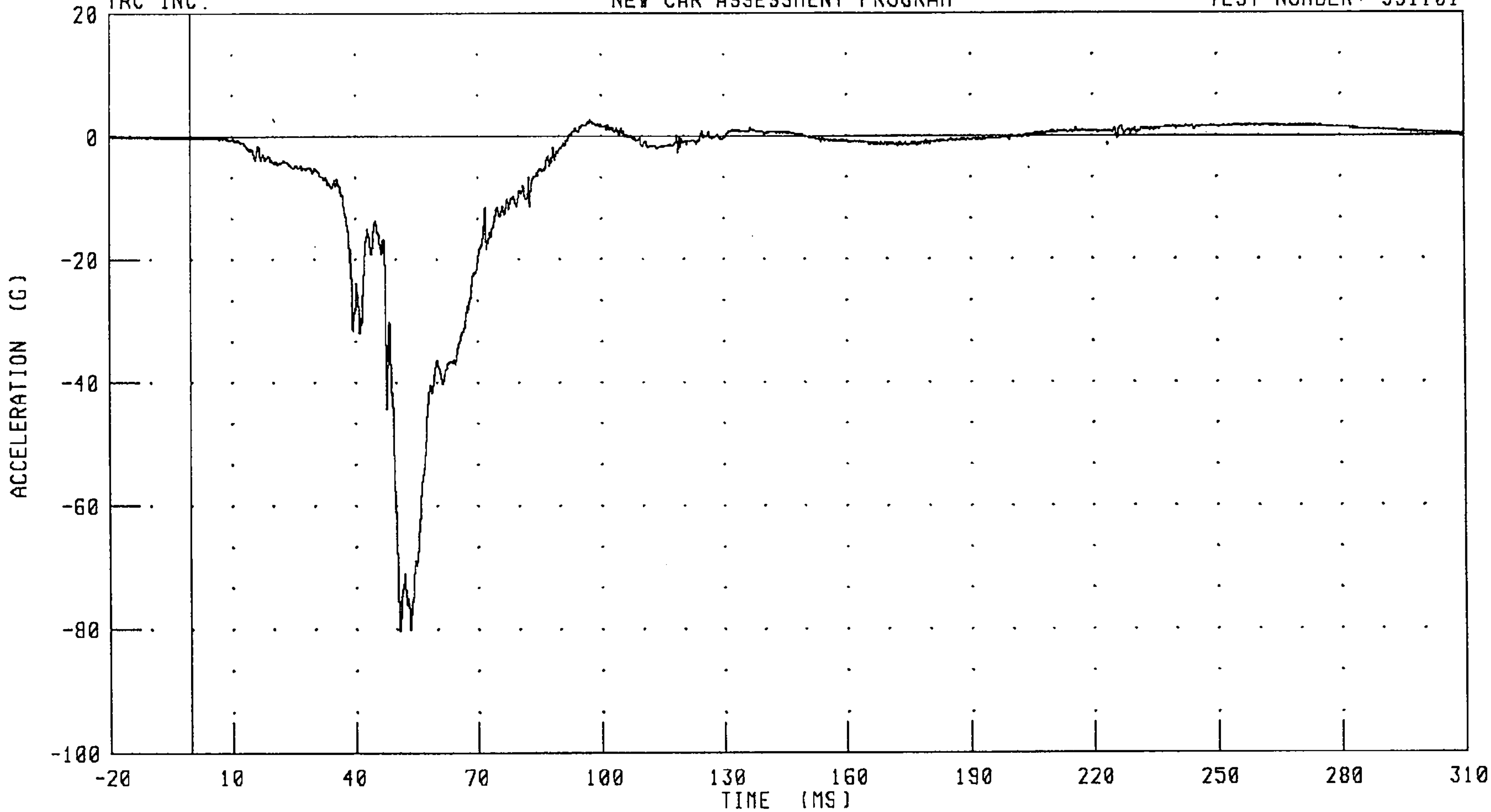
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST DEFLECTION
NEW CAR ASSESSMENT PROGRAM



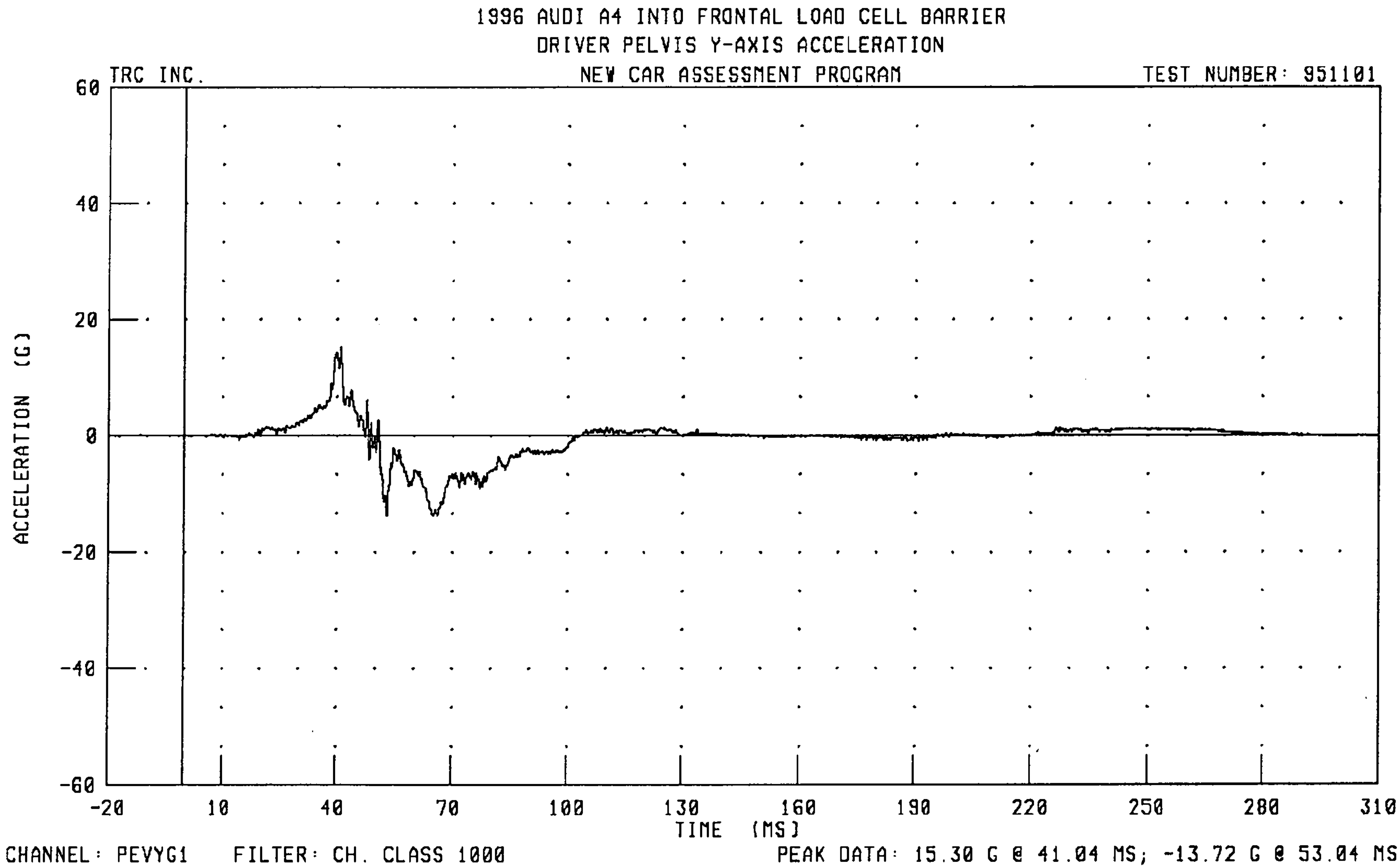
CHANNEL: CSTXD1 FILTER: CH. CLASS 180 PEAK DATA: 0.02 MM @ 11.60 MS; -37.72 MM @ 65.76 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER PELVIS X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TRC INC. TEST NUMBER: 951101

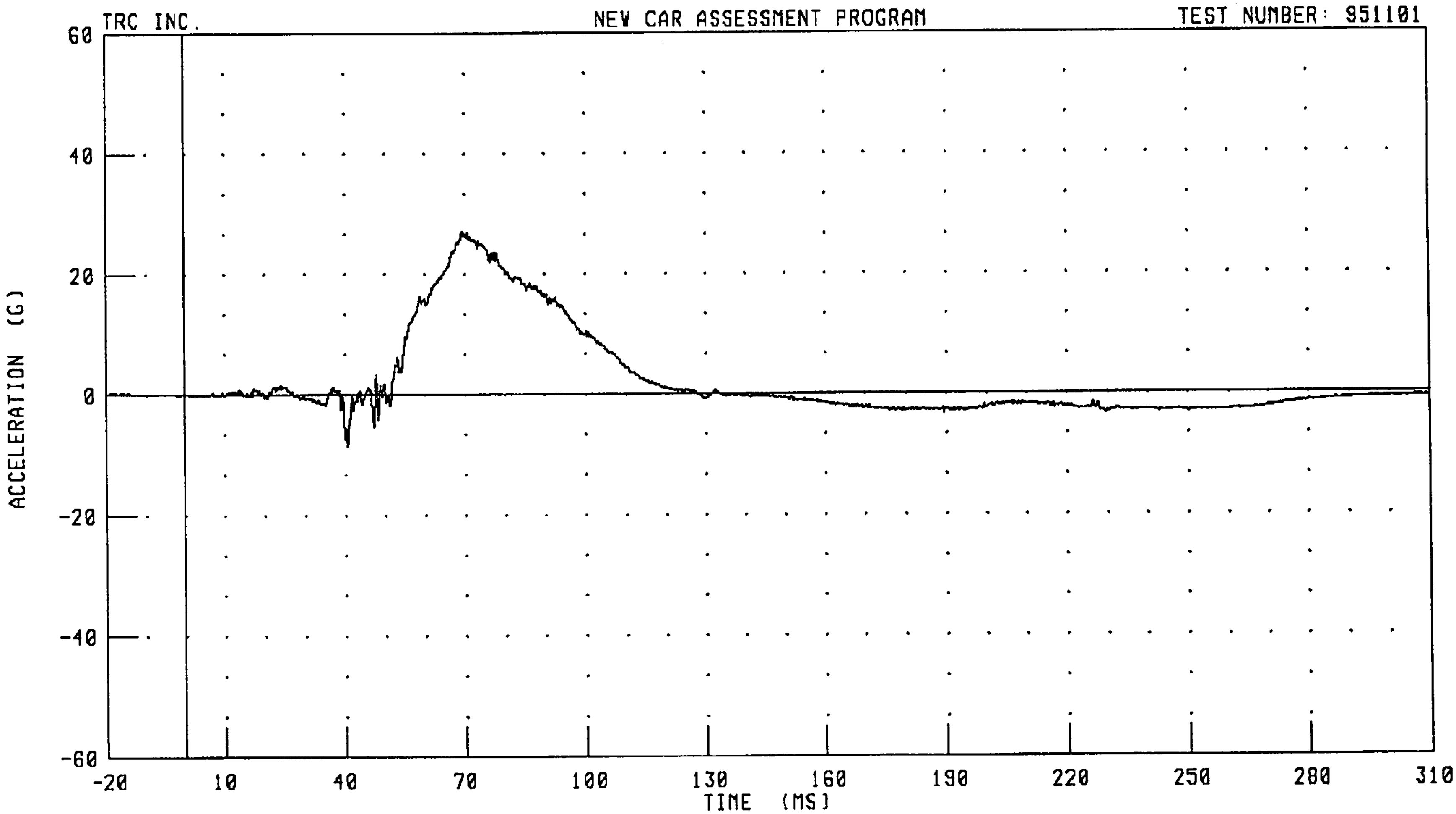


CHANNEL: PEVXG1 FILTER: CH. CLASS 1000 PEAK DATA: 2.62 G @ 97.44 MS; -80.33 G @ 50.80 MS



1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER PELVIS Y-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM
TRC INC.
TEST NUMBER: 951101
ACCELERATION (G)
60
40
20
0
-20
-40
-60
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: PEVYG1 FILTER: CH. CLASS 1000
PEAK DATA: 15.30 G @ 41.04 MS; -13.72 G @ 53.04 MS

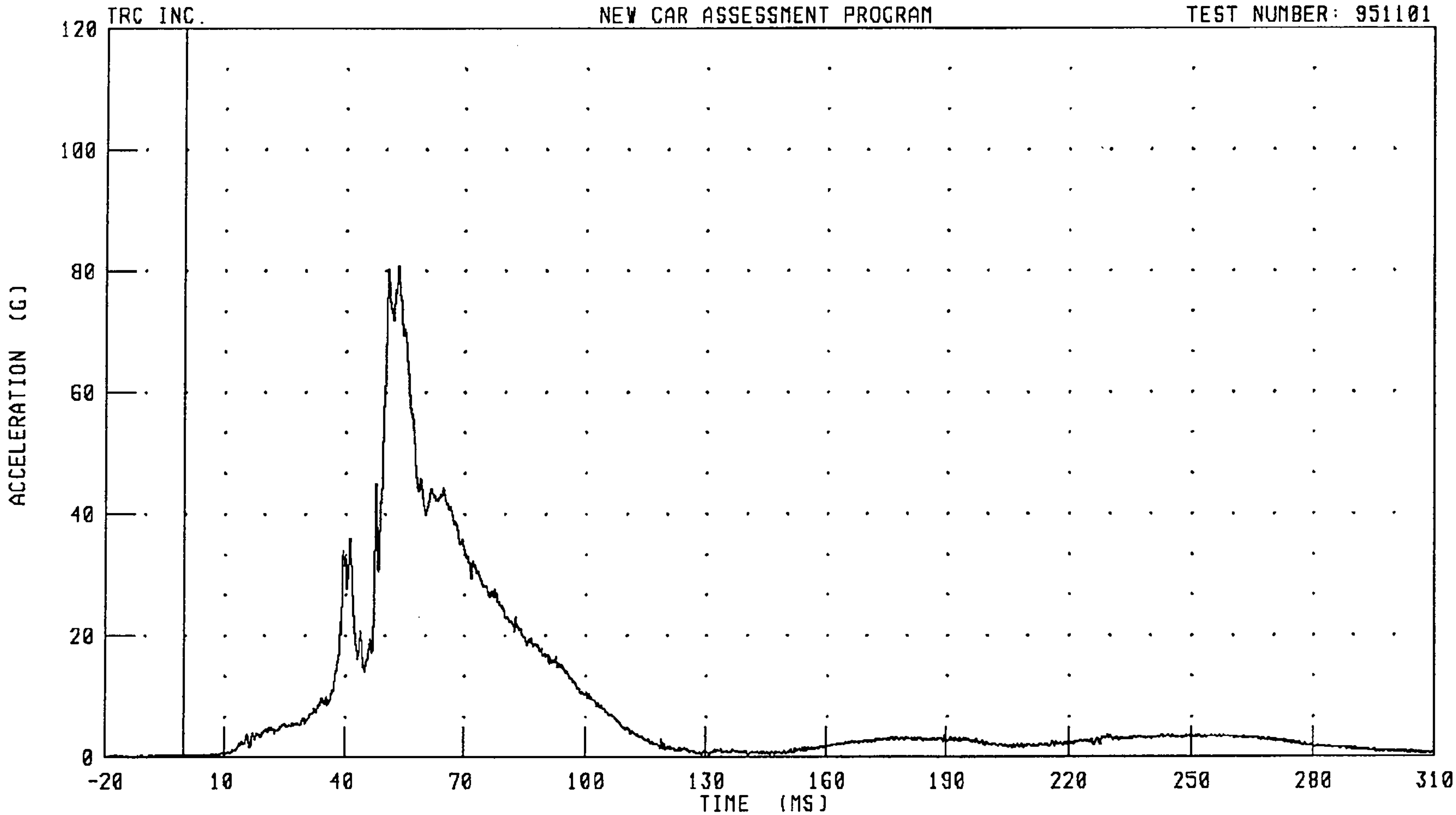
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER PELVIS Z-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM



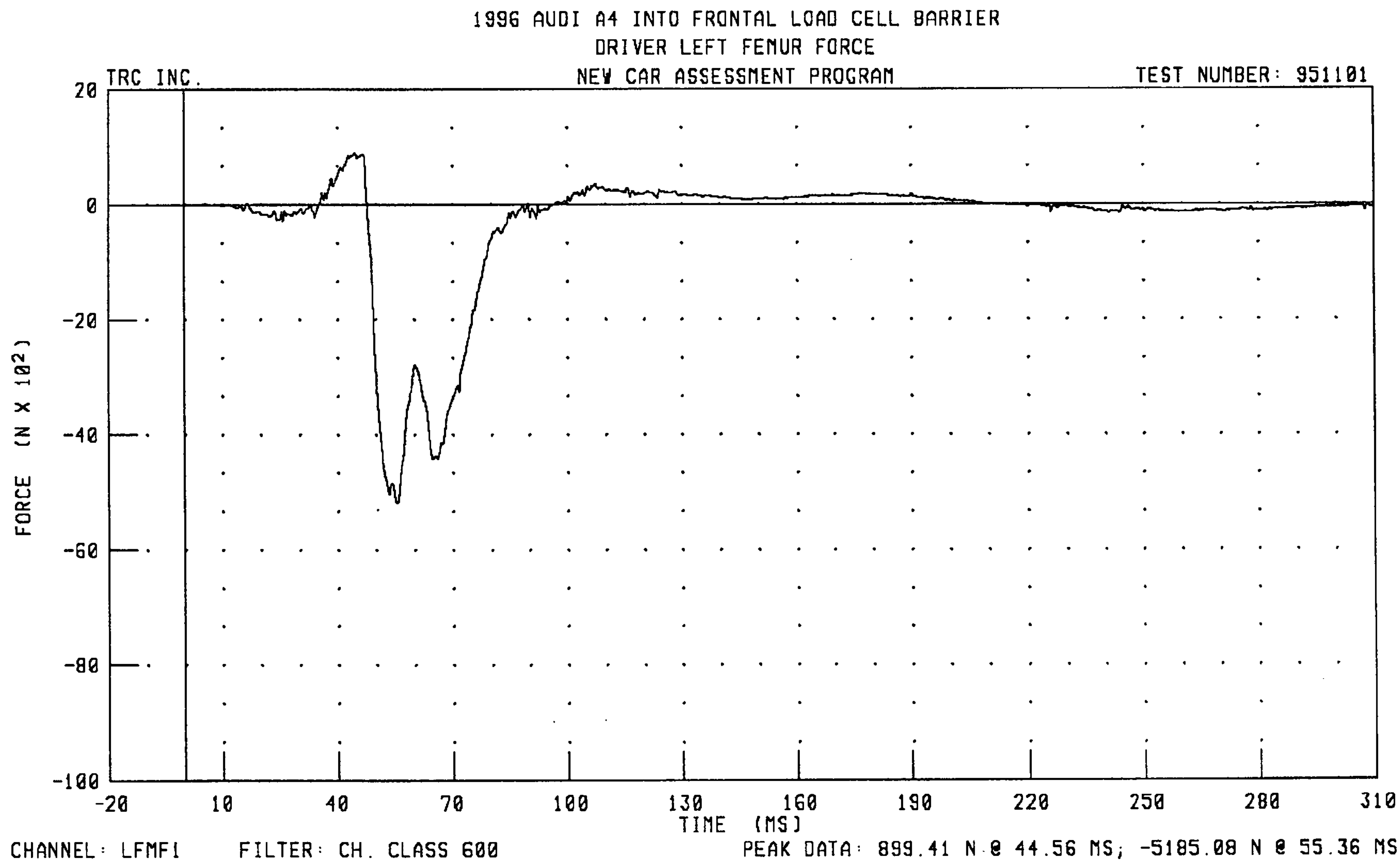
CHANNEL: PEVZG1 FILTER: CH. CLASS 1000

PEAK DATA: 27.11 G @ 69.60 MS; -8.55 G @ 40.72 MS

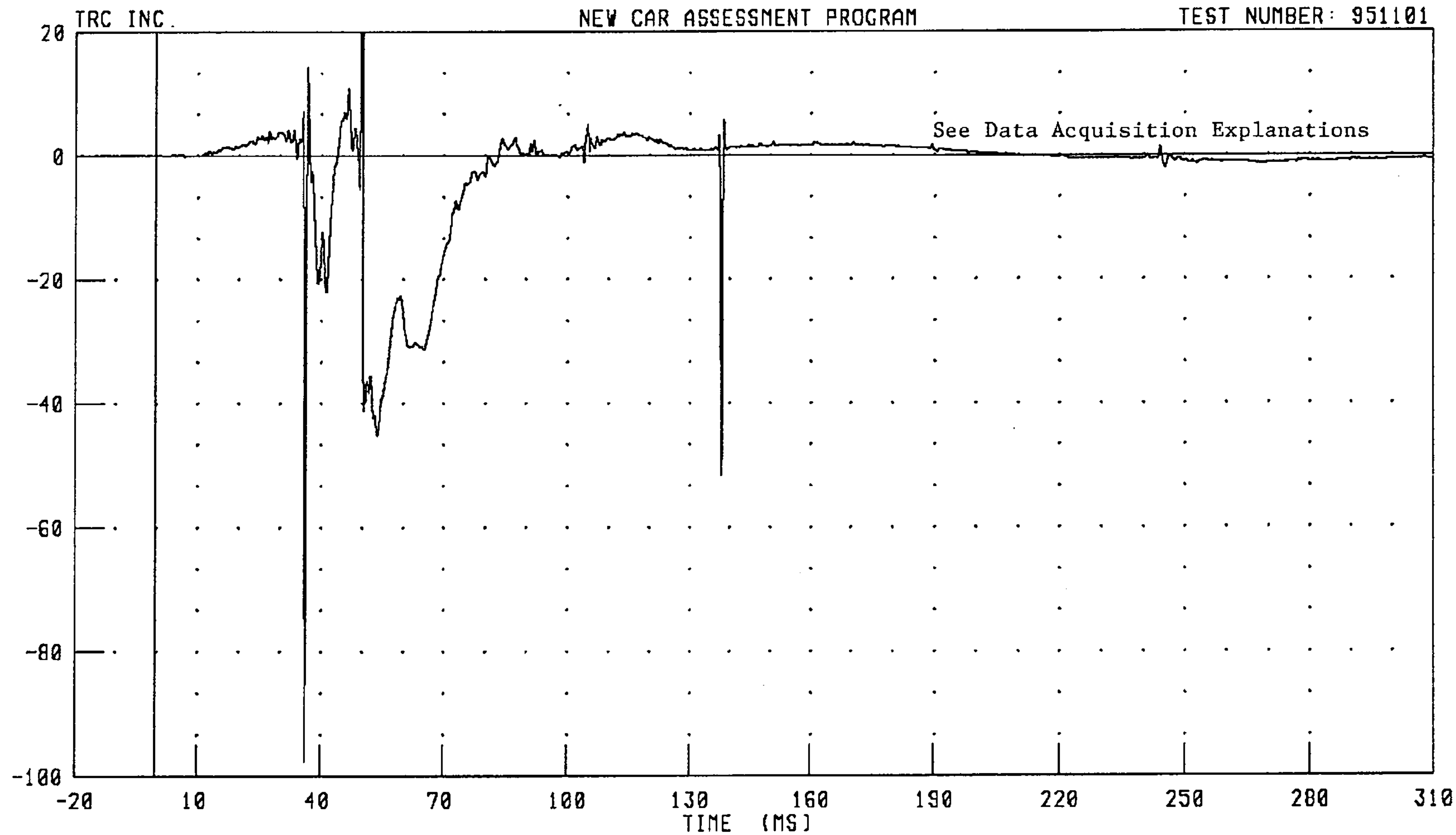
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER PELVIS RESULTANT ACCELERATION
NEW CAR ASSESSMENT PROGRAM



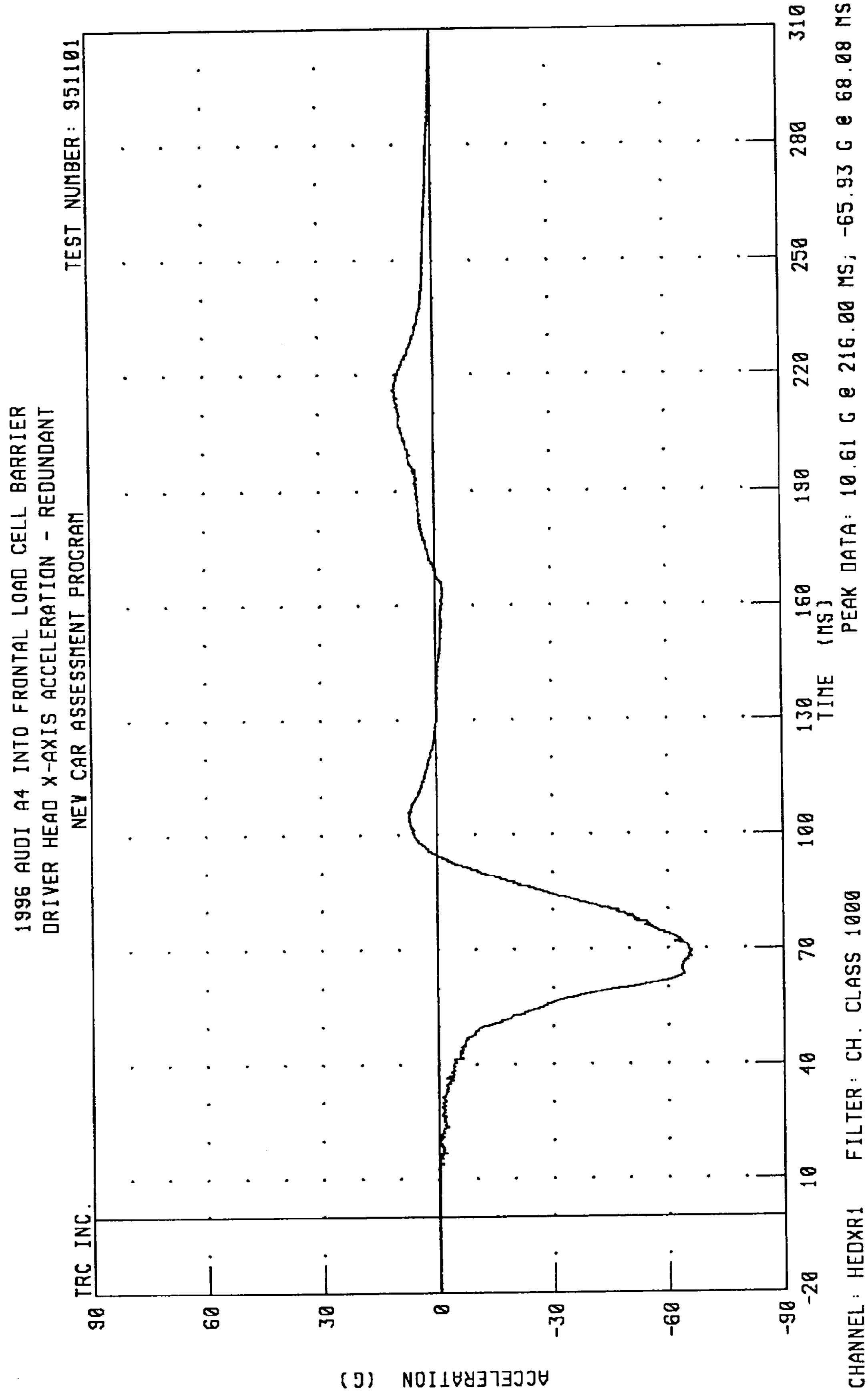
CHANNEL: PEVRG1 FILTER: CH. CLASS 1000 PEAK DATA: 80.89 G @ 53.36 MS; 0.10 G @ -20.00 MS


1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER LEFT FEMUR FORCE
NEW CAR ASSESSMENT PROGRAM
TRC INC.
TEST NUMBER: 951101
20
0
-20
-40
-60
-80
-100
FORCE (N X 10²)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: LFMFI
FILTER: CH. CLASS 600
PEAK DATA: 899.41 N @ 44.56 MS; -5185.08 N @ 55.36 MS

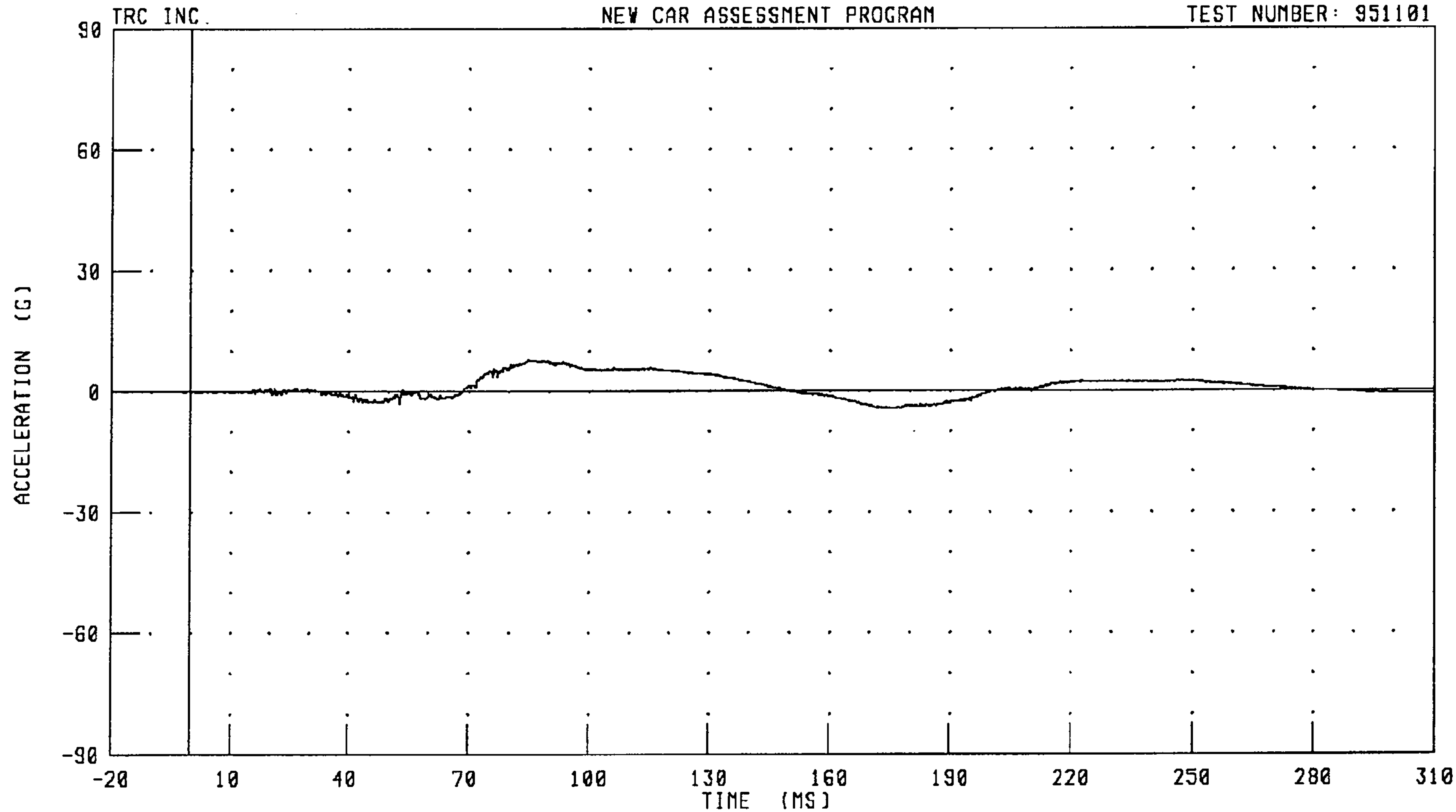
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER RIGHT FEMUR FORCE
NEW CAR ASSESSMENT PROGRAM



CHANNEL: RFMF1 FILTER: CH. CLASS 600 PEAK DATA: 7348.89 N @ 49.92 MS; -9766.78 N @ 36.24 MS


1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD X-AXIS ACCELERATION - REDUNDANT
NEW CAR ASSESSMENT PROGRAM
TEST NUMBER: 951101
TRC INC.
ACCELERATION (G)
90
60
30
0
-30
-60
-90
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: HEDXR1
FILTER: CH. CLASS 1000
PEAK DATA: 10.61 G @ 216.00 MS; -65.93 G @ 68.08 MS

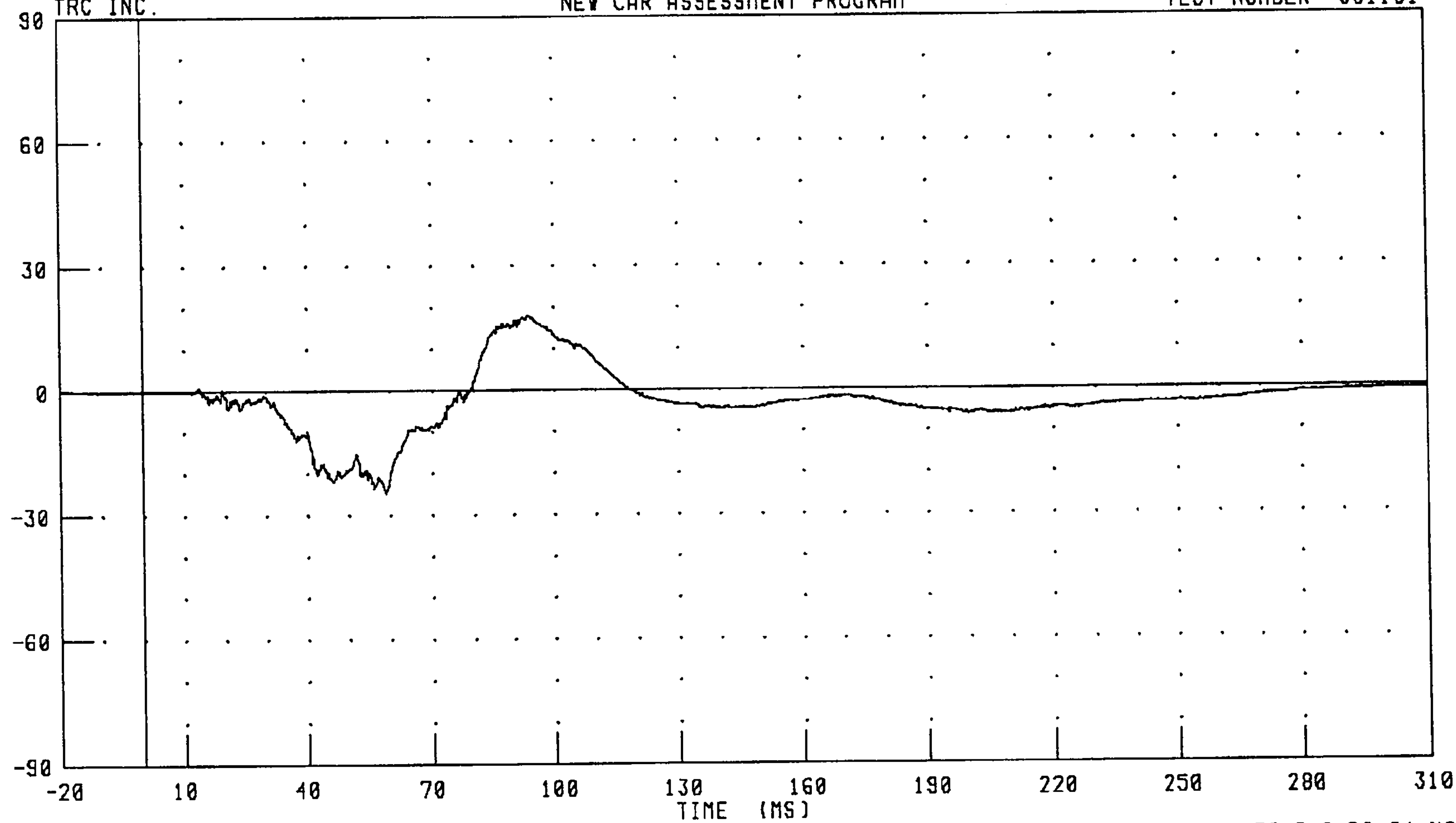
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD Y-AXIS ACCELERATION - REDUNDANT
NEW CAR ASSESSMENT PROGRAM



CHANNEL: HEDYR1 FILTER: CH. CLASS 1000 PEAK DATA: 7.93 G @ 84.72 MS; -4.38 G @ 175.60 MS

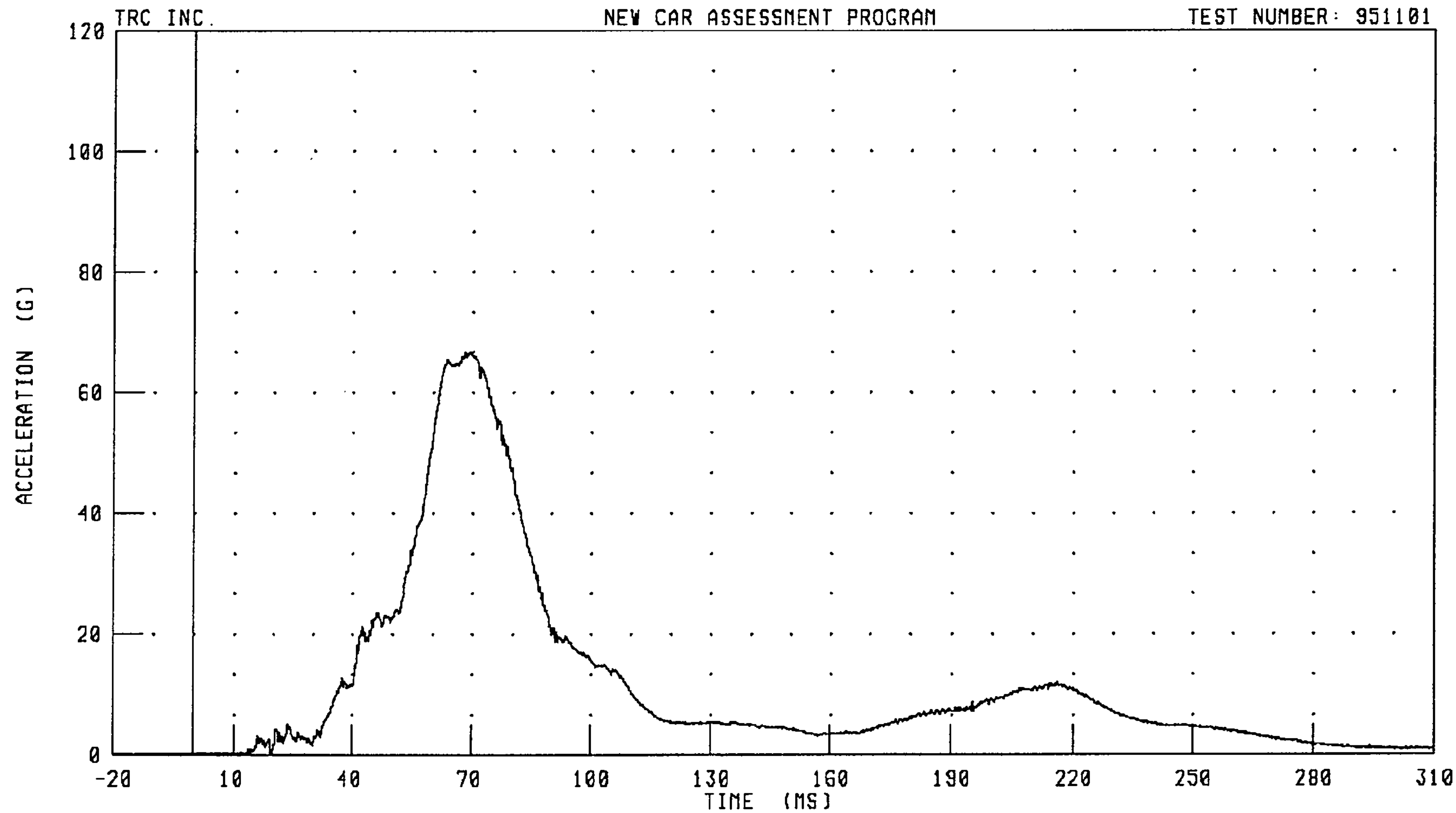
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD Z-AXIS ACCELERATION - REDUNDANT
NEW CAR ASSESSMENT PROGRAM

TRC INC. TEST NUMBER: 951101



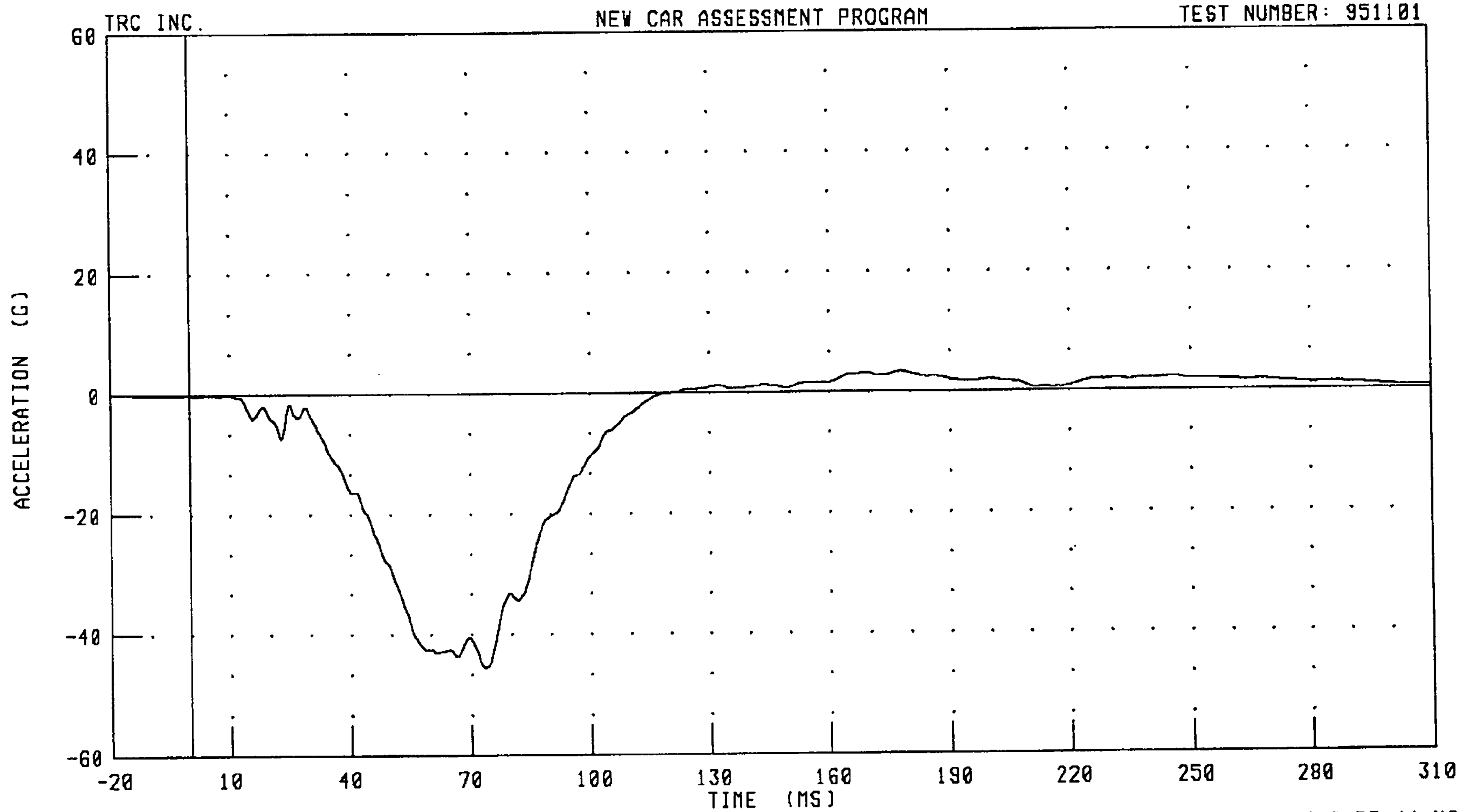
CHANNEL: HEDZR1 FILTER: CH. CLASS 1000 PEAK DATA: 18.07 G @ 93.60 MS; -24.78 G @ 59.04 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD RESULTANT ACCELERATION - REDUNDANT
NEW CAR ASSESSMENT PROGRAM



CHANNEL: HEDRR1 FILTER: CH. CLASS 1000 PEAK DATA: 66.59 G @ 69.20 MS; 0.11 G @ -19.68 MS

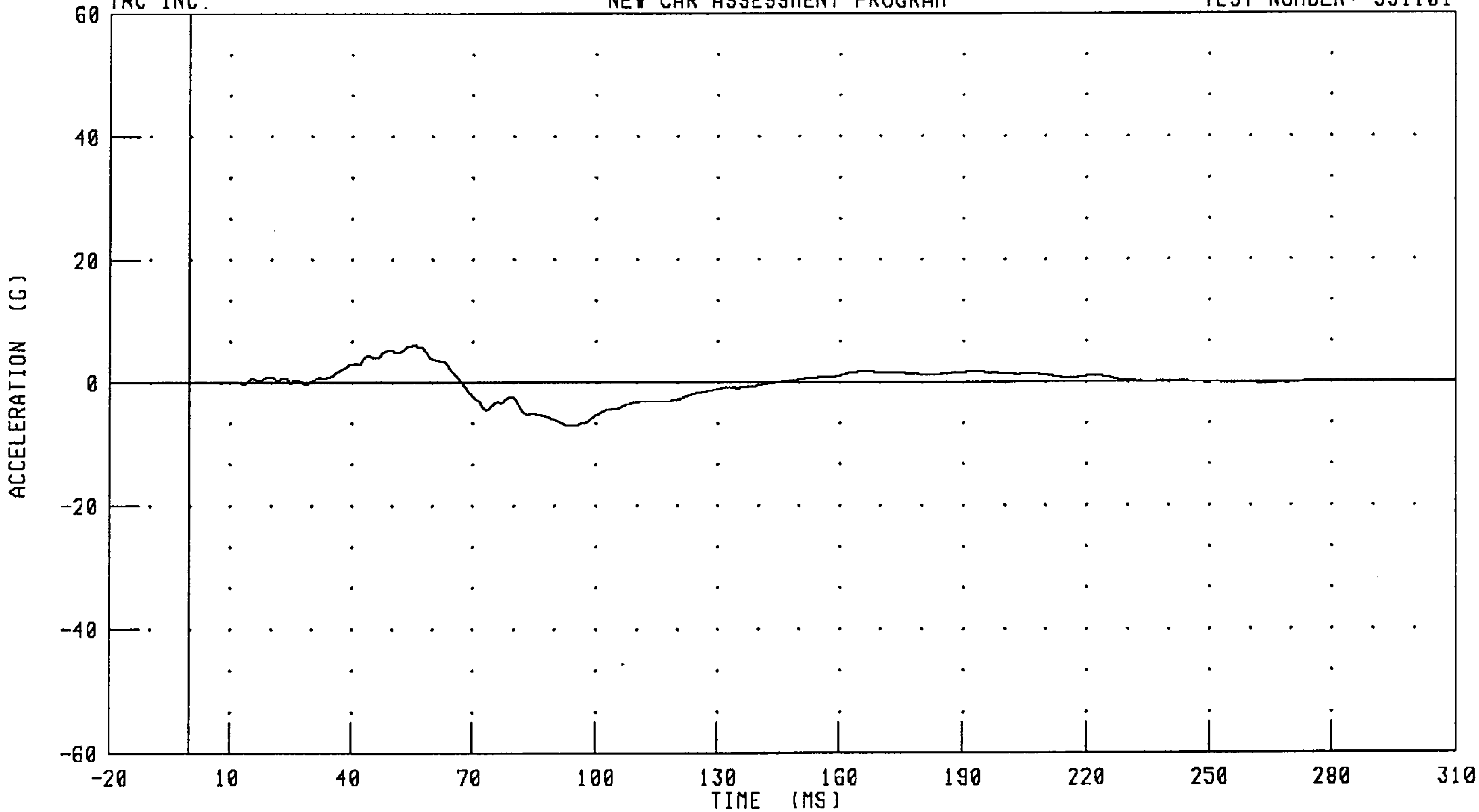
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST X-AXIS ACCELERATION - REDUNDANT
NEW CAR ASSESSMENT PROGRAM



CHANNEL: CSTXR1 FILTER: CH. CLASS 180
PEAK DATA: 3.35 G @ 177.76 MS; -45.50 G @ 73.44 MS

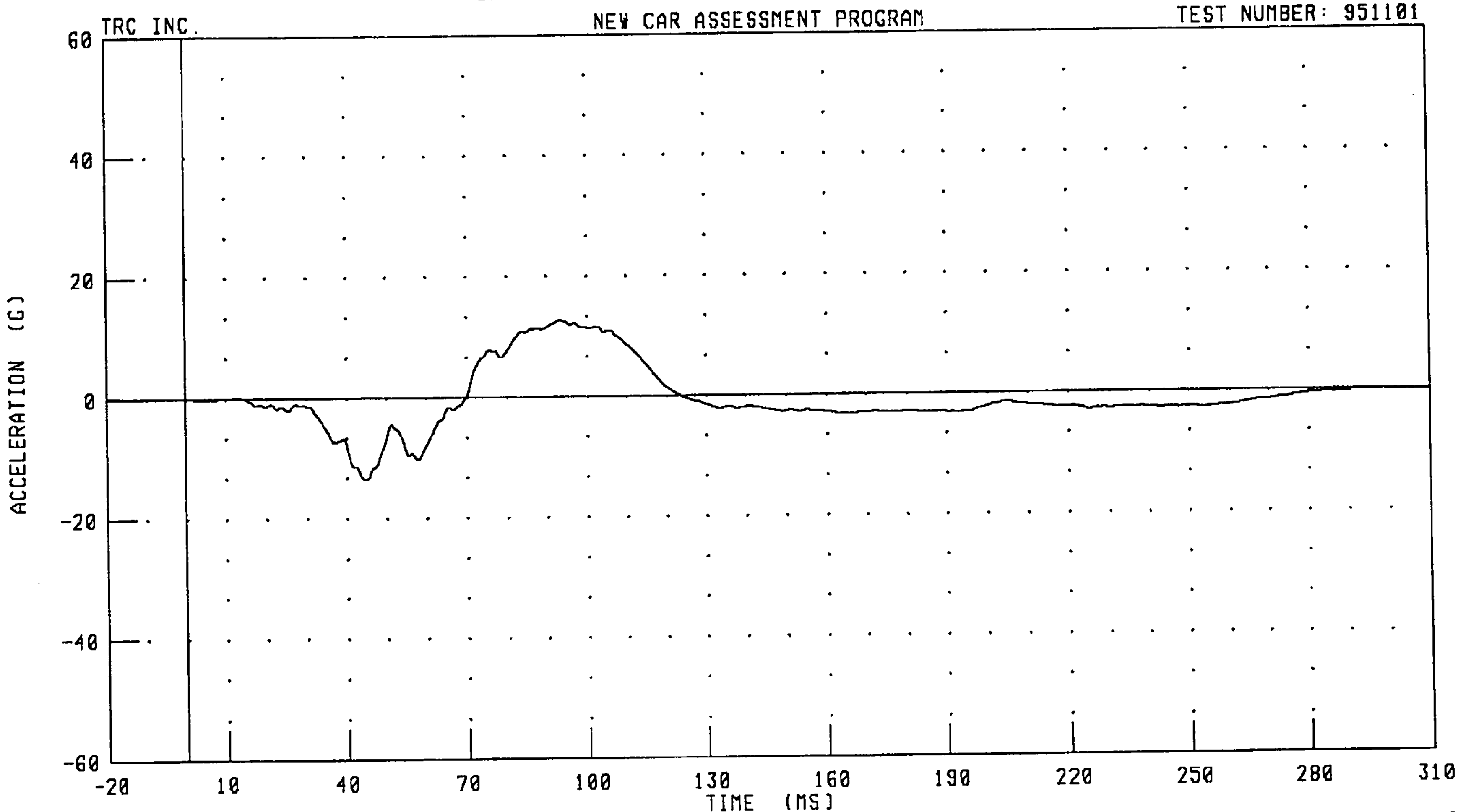
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST Y-AXIS ACCELERATION - REDUNDANT
NEW CAR ASSESSMENT PROGRAM

TRC INC. TEST NUMBER: 951101



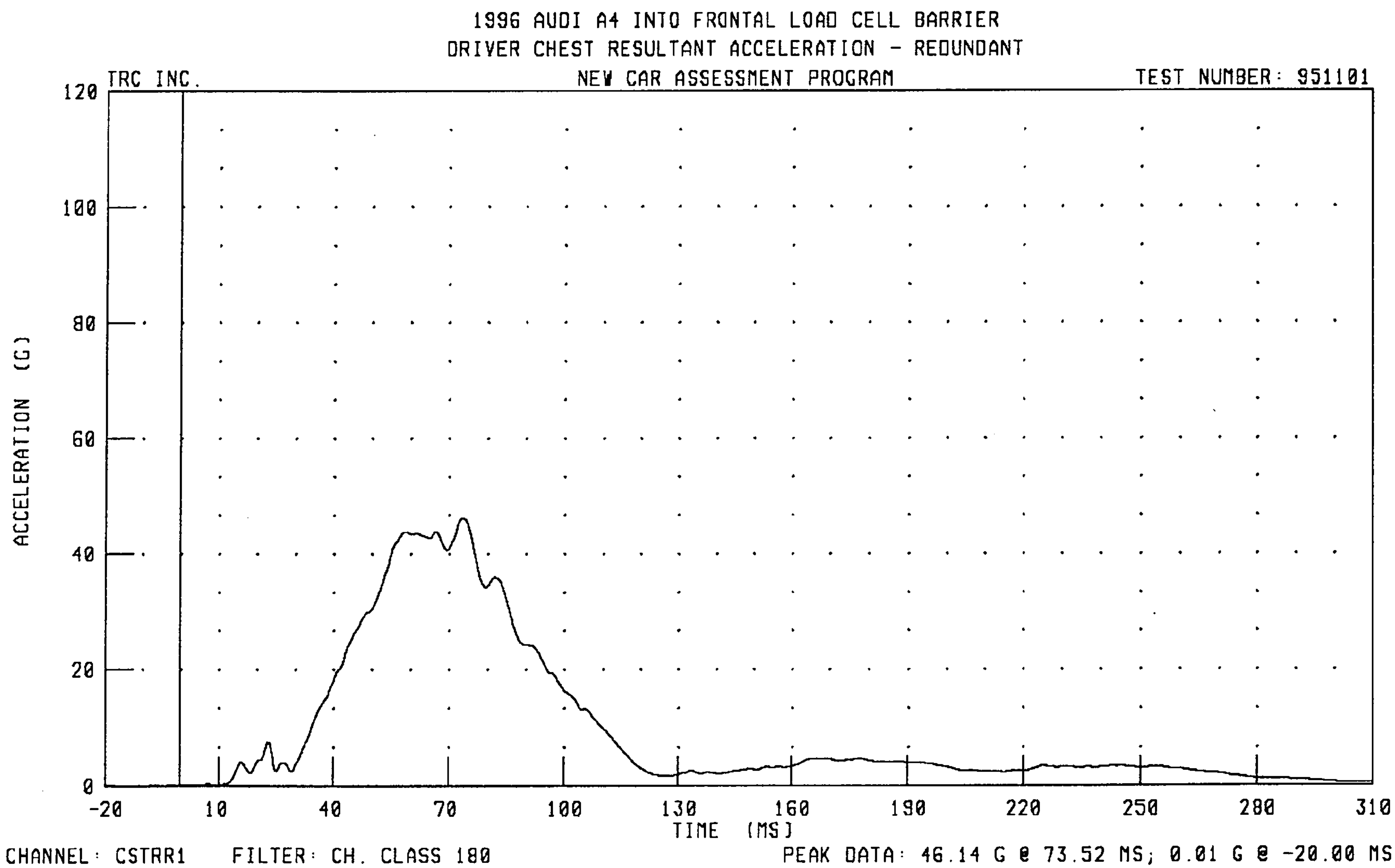
CHANNEL: CSTYR1 FILTER: CH. CLASS 180 PEAK DATA: 6.10 G @ 55.60 MS; -6.93 G @ 93.68 MS

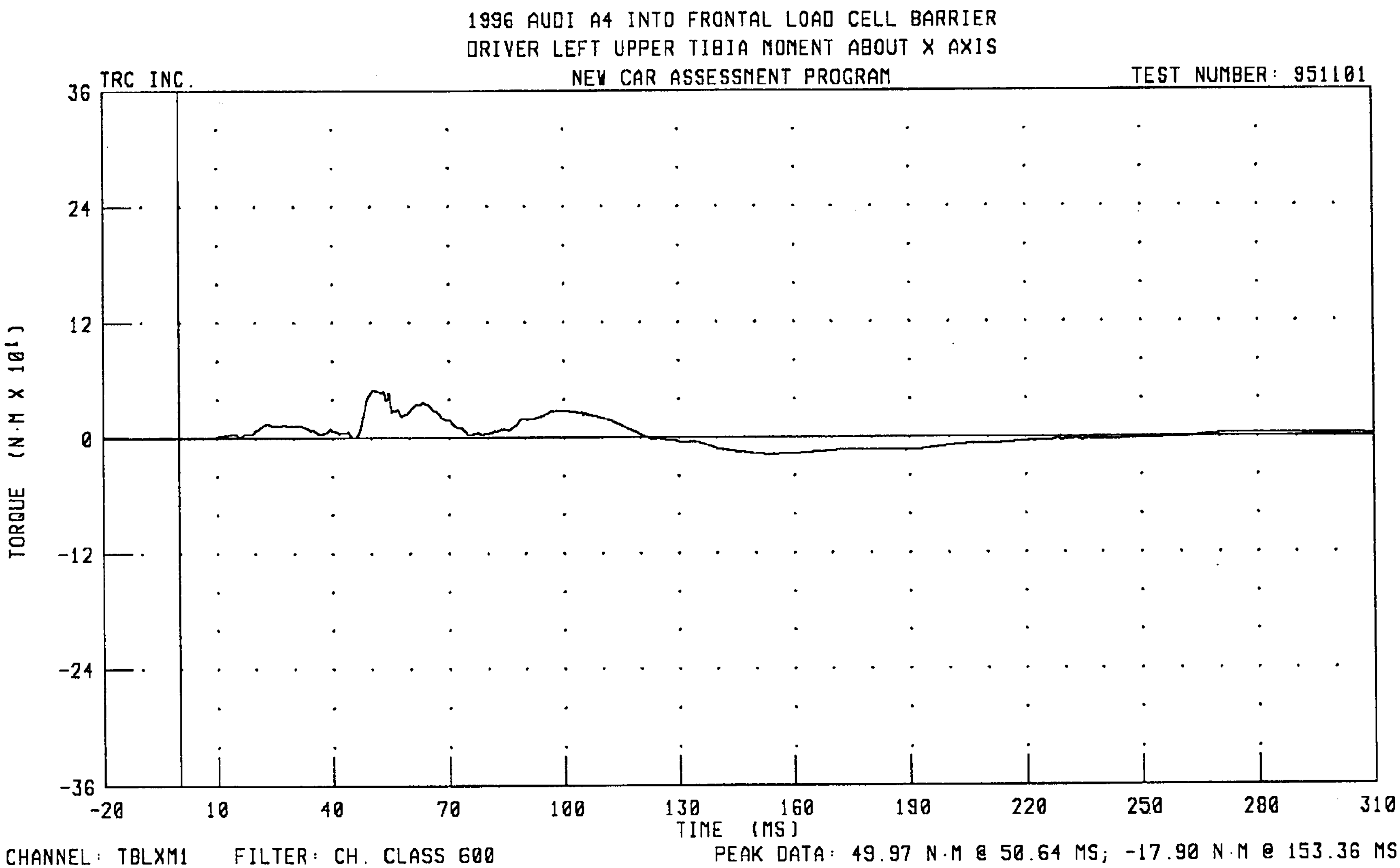
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST Z-AXIS ACCELERATION - REDUNDANT
NEW CAR ASSESSMENT PROGRAM



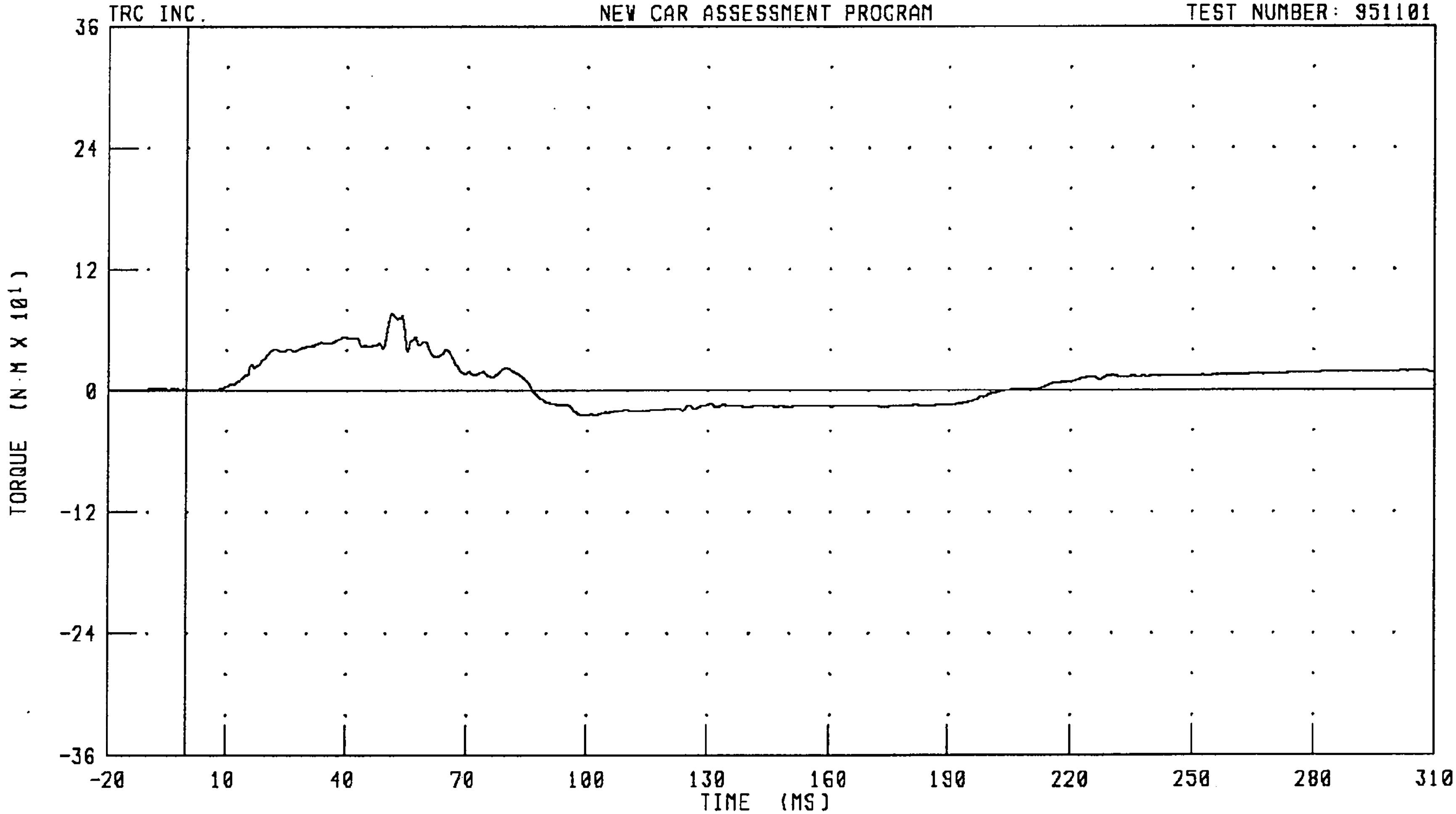
CHANNEL: CSTZR1   FILTER: CH. CLASS 180

PEAK DATA: 12.66 G @ 93.44 MS; -13.60 G @ 44.96 MS


1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST RESULTANT ACCELERATION - REDUNDANT
NEW CAR ASSESSMENT PROGRAM
TRC INC.
TEST NUMBER: 951101
ACCELERATION (G)
120
100
80
60
40
20
0
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: CSTRR1
FILTER: CH. CLASS 180
PEAK DATA: 46.14 G @ 73.52 MS; 0.01 G @ -20.00 MS

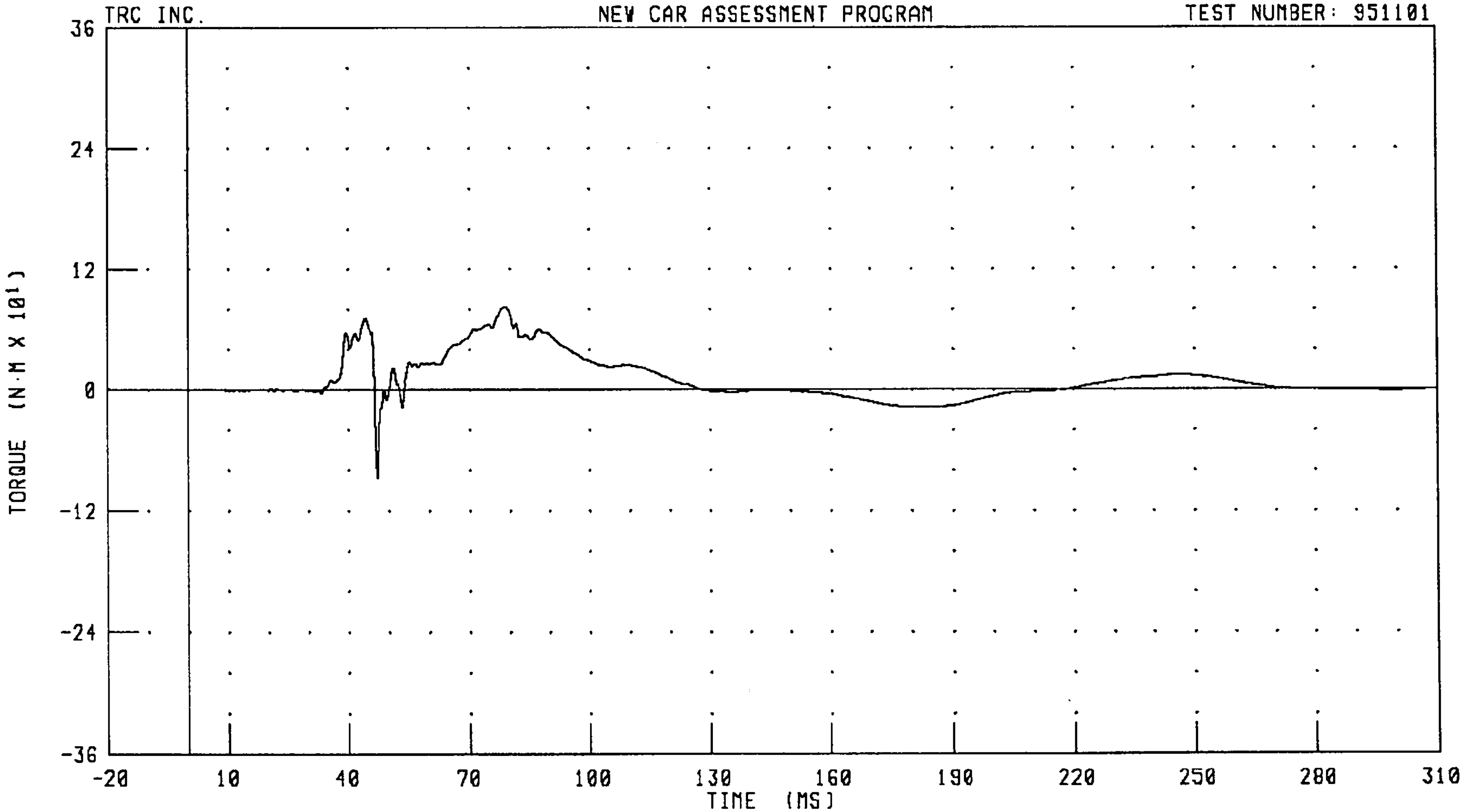

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER LEFT UPPER TIBIA MOMENT ABOUT X AXIS
NEW CAR ASSESSMENT PROGRAM
TRC INC.
TEST NUMBER: 951101
36
24
12
0
-12
-24
-36
TORQUE (N·M X 10¹)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: TBLXM1
FILTER: CH. CLASS 600
PEAK DATA: 49.97 N·M @ 50.64 MS; -17.90 N·M @ 153.36 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER LEFT UPPER TIBIA MOMENT ABOUT Y AXIS
NEW CAR ASSESSMENT PROGRAM



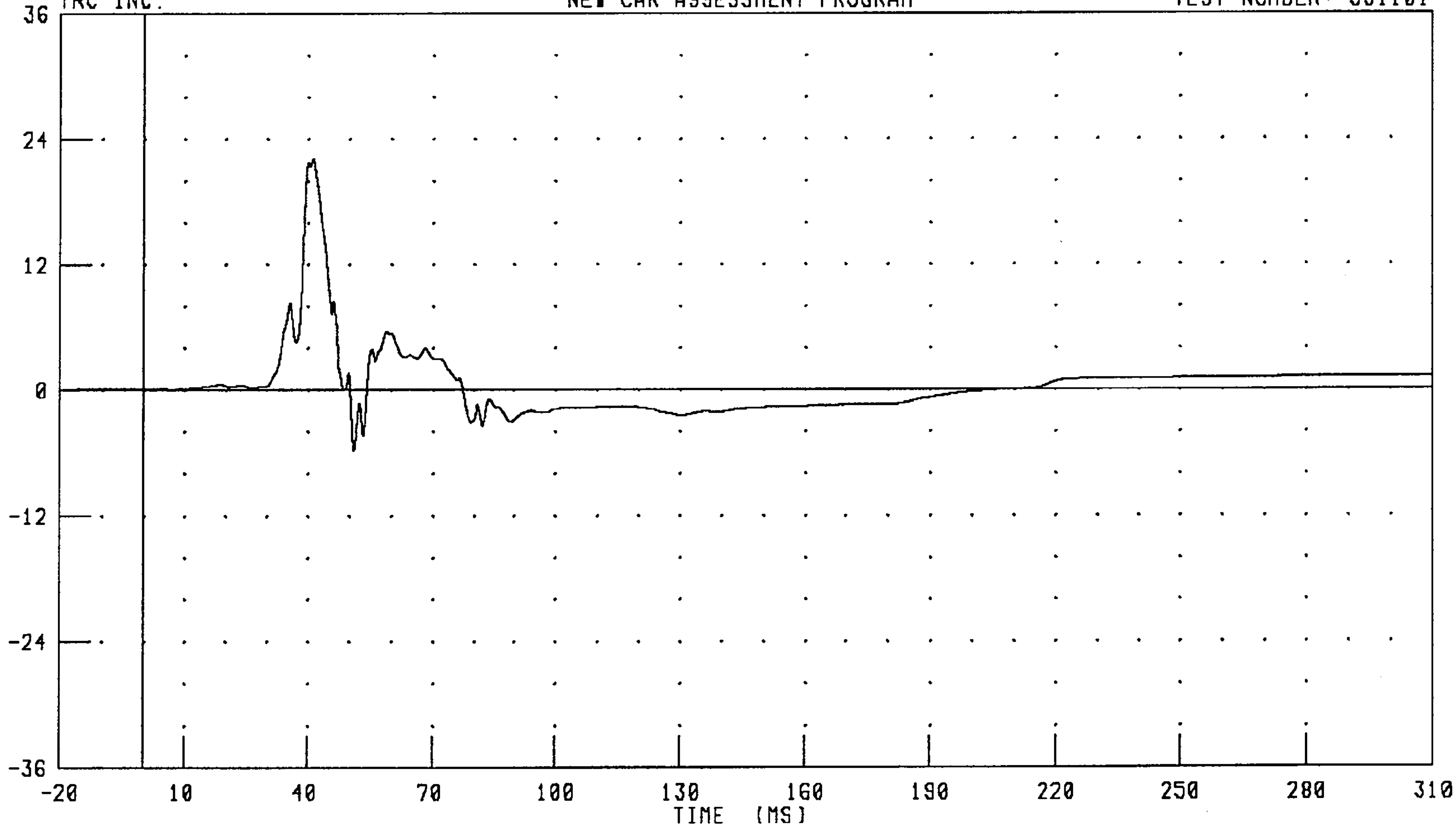
CHANNEL: TBLYM1 FILTER: CH. CLASS 600 PEAK DATA: 75.93 N·M @ 51.52 MS; -24.57 N·M @ 98.88 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER RIGHT UPPER TIBIA MOMENT ABOUT X AXIS
NEW CAR ASSESSMENT PROGRAM



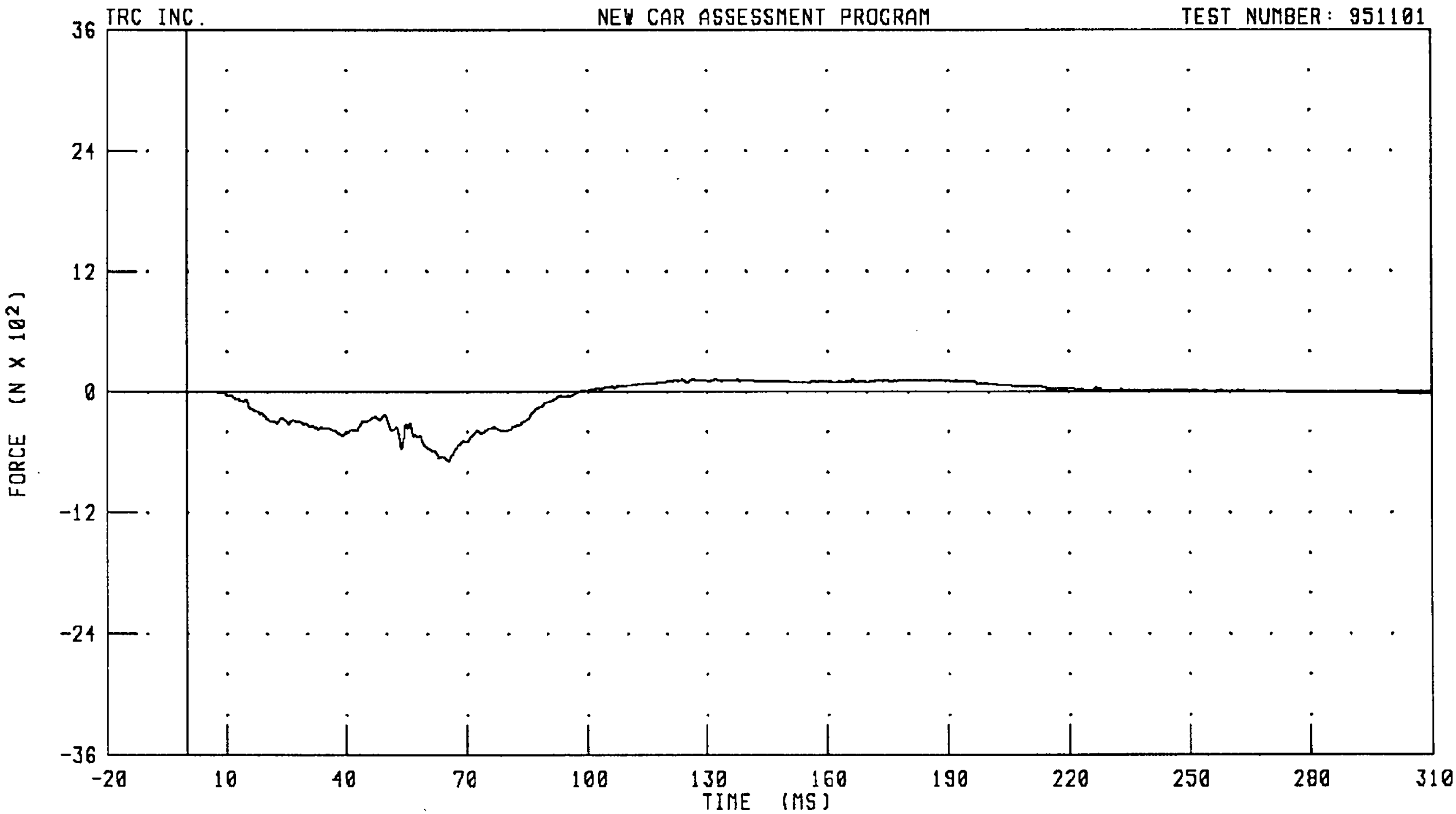
CHANNEL: TBRXM1 FILTER: CH. CLASS 600 PEAK DATA: 82.39 N·M @ 78.96 MS; -87.13 N·M @ 47.20 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER RIGHT UPPER TIBIA MOMENT ABOUT Y AXIS
NEW CAR ASSESSMENT PROGRAM

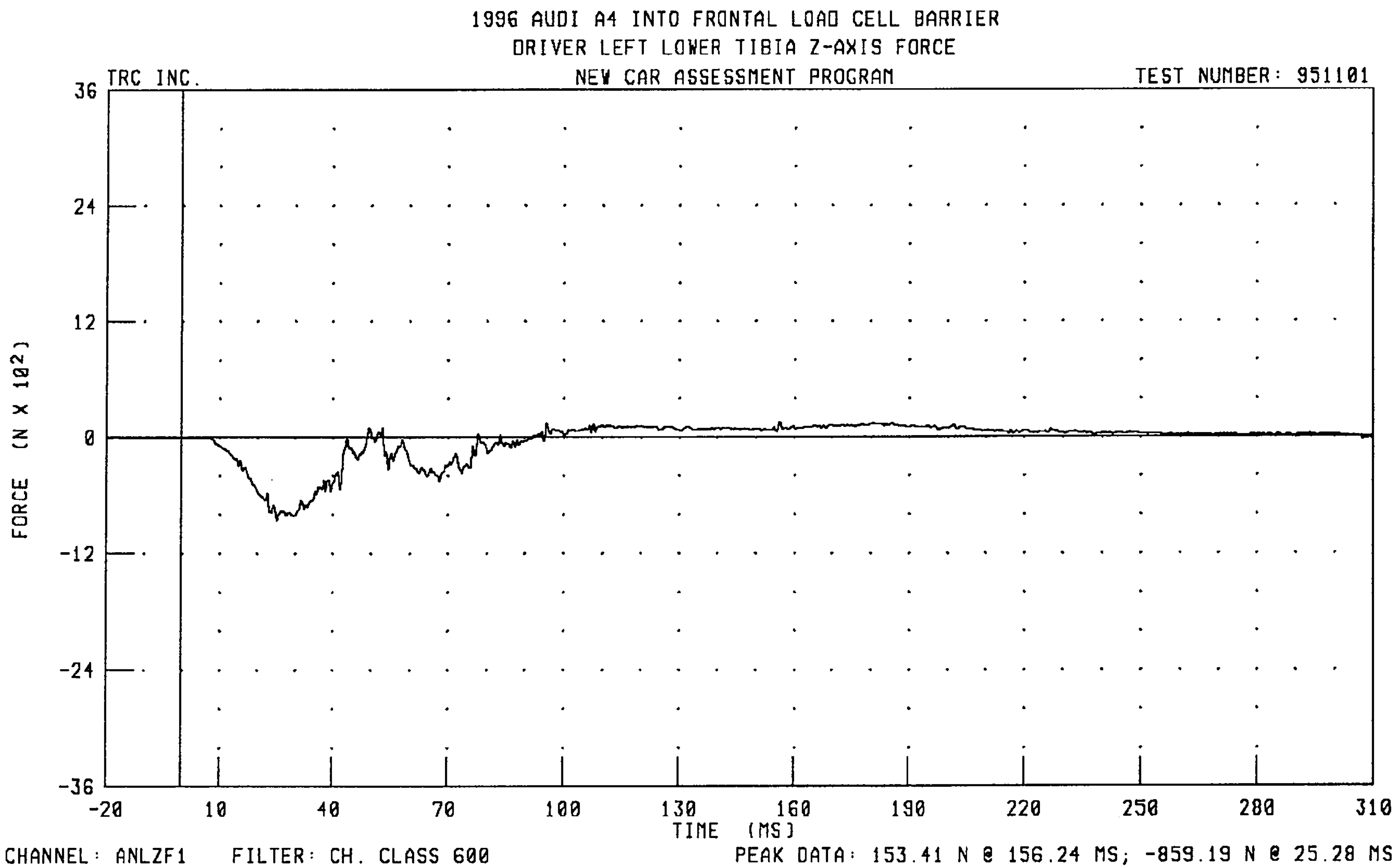


CHANNEL: TBRYM1   FILTER: CH. CLASS 600   PEAK DATA: 221.61 N·M @ 41.36 MS; -58.10 N·M @ 51.12 MS

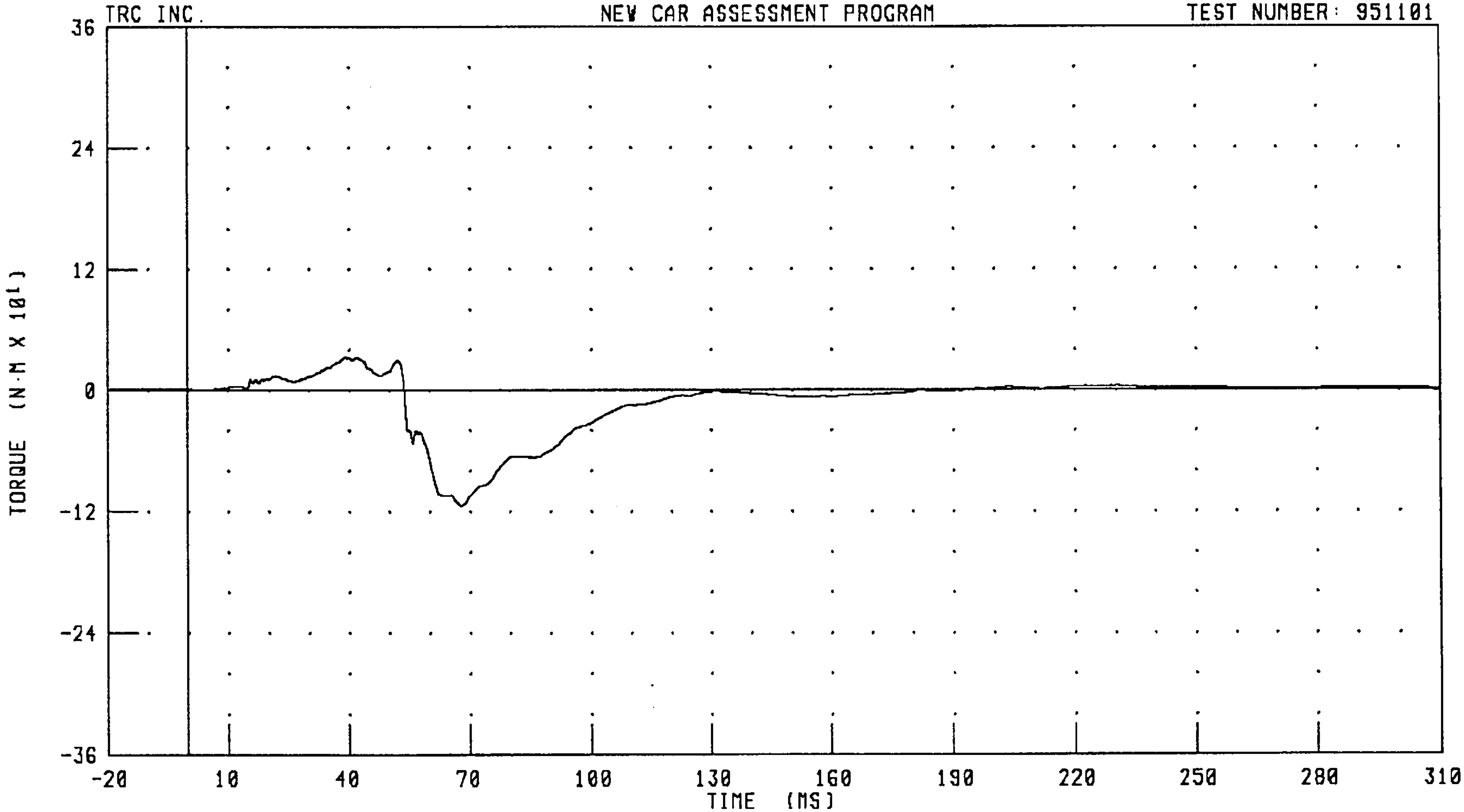
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER LEFT LOWER TIBIA X-AXIS FORCE
NEW CAR ASSESSMENT PROGRAM



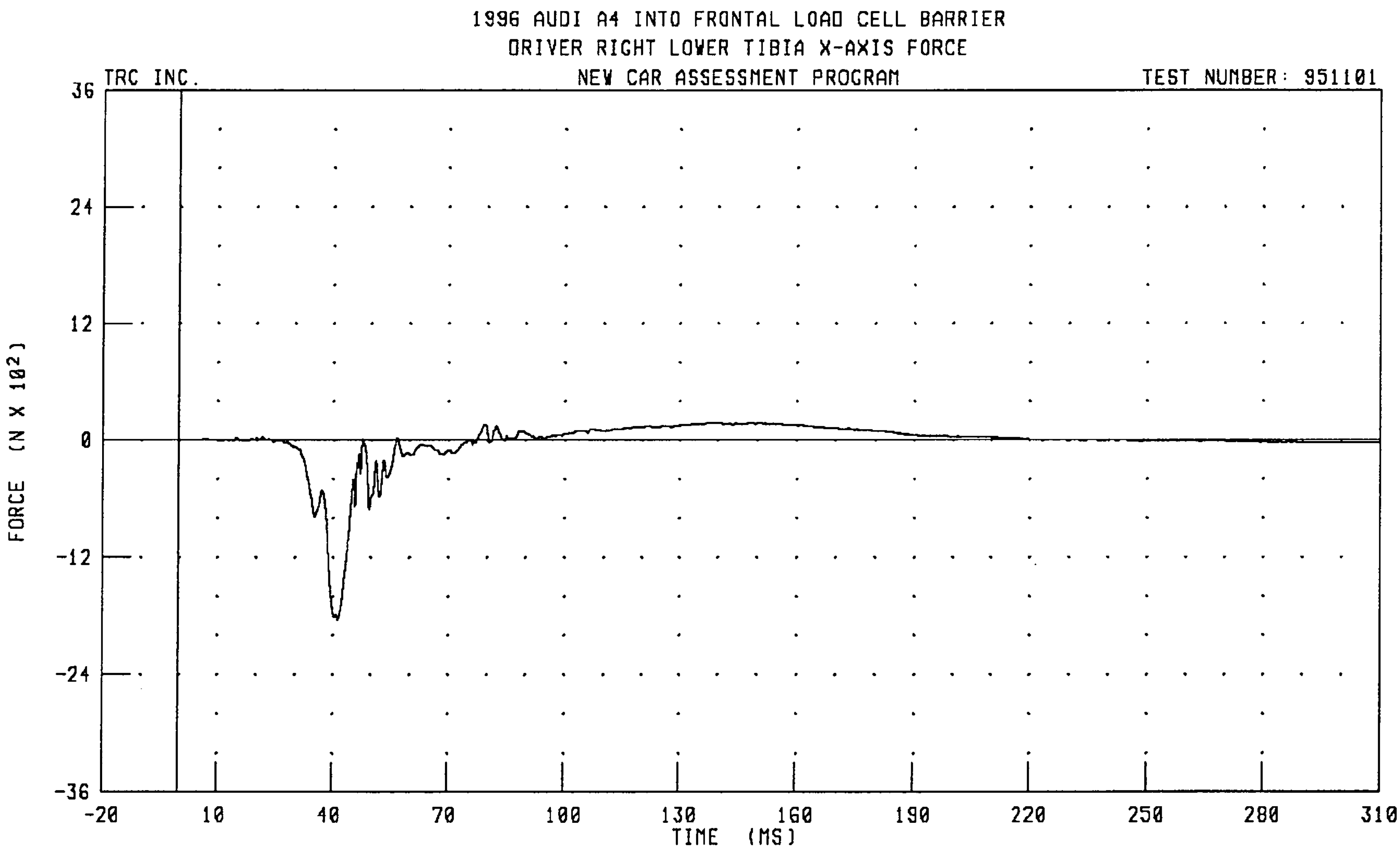
CHANNEL: ANLXF1 FILTER: CH. CLASS 600 PEAK DATA: 127.10 N @ 166.56 MS; -686.00 N @ 65.52 MS


1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER LEFT LOWER TIBIA Z-AXIS FORCE
NEW CAR ASSESSMENT PROGRAM
TRC INC.
TEST NUMBER: 951101
FORCE (N X 10²)
36
24
12
0
-12
-24
-36
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: ANLZF1
FILTER: CH. CLASS 600
PEAK DATA: 153.41 N @ 156.24 MS; -859.19 N @ 25.28 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER LEFT LOWER TIBIA MOMENT ABOUT Y AXIS
NEW CAR ASSESSMENT PROGRAM

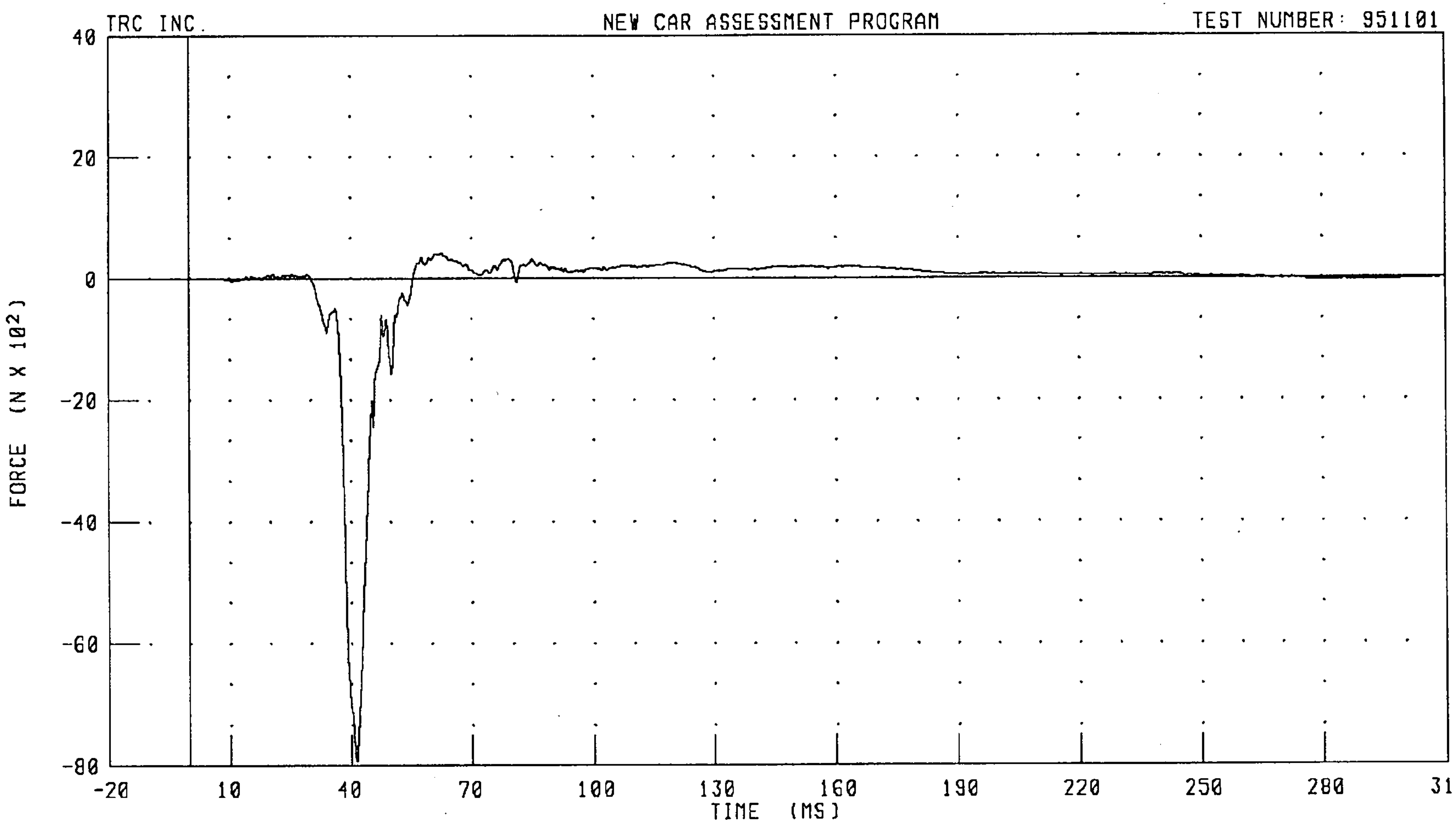


CHANNEL: ANLYM1 FILTER: CH. CLASS 600 PEAK DATA: 32.18 N·M @ 39.20 MS; -115.05 N·M @ 67.84 MS



CHANNEL: ANRXF1 FILTER: CH. CLASS 600 PEAK DATA: 172.97 N @ 150.40 MS; -1841.57 N @ 41.44 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER RIGHT LOWER TIBIA Z-AXIS FORCE
NEW CAR ASSESSMENT PROGRAM

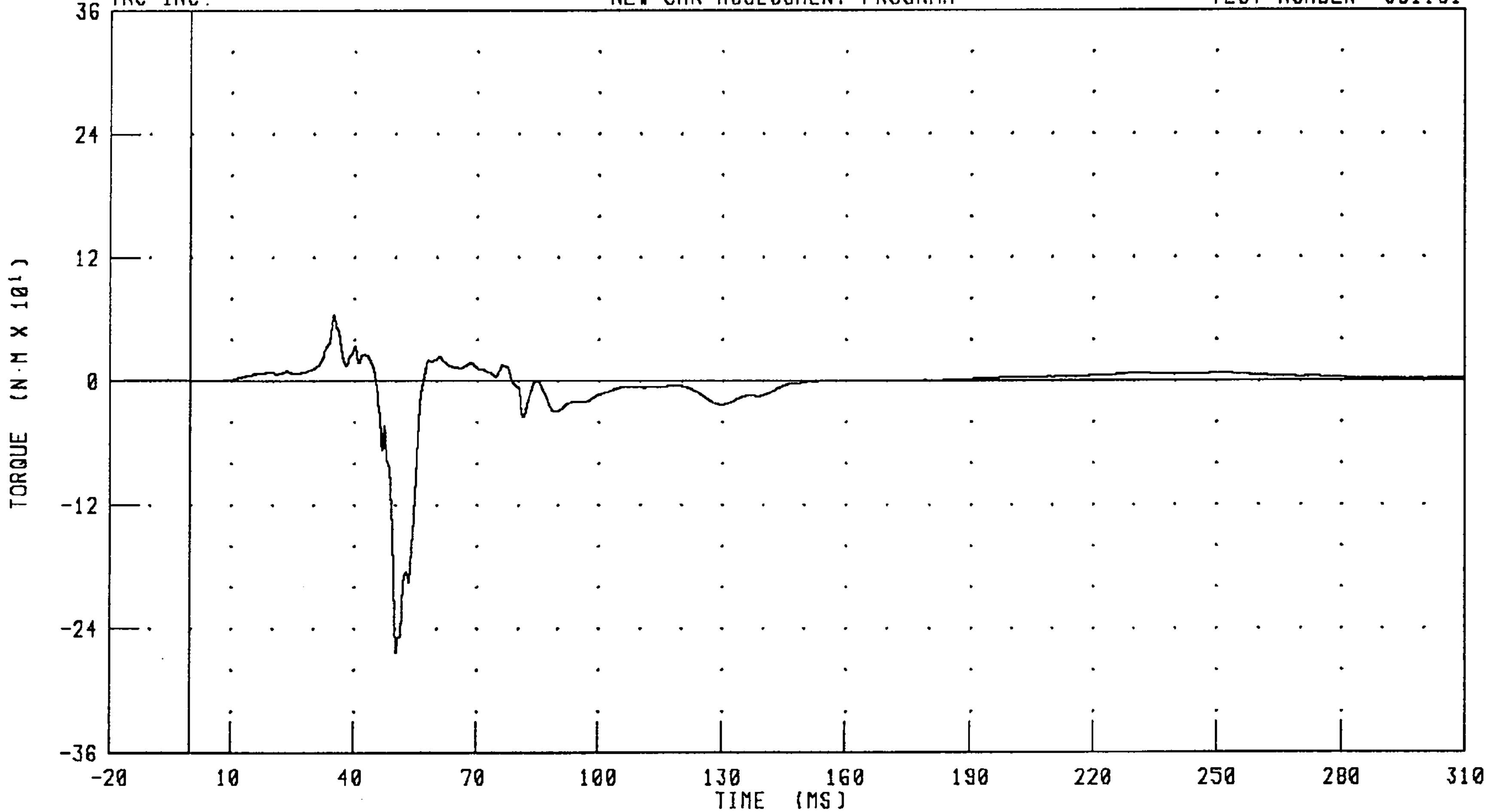


CHANNEL: ANRZF1 FILTER: CH. CLASS 600 PEAK DATA: 421.06 N @ 62.72 MS; -7924.77 N @ 41.28 MS

951101

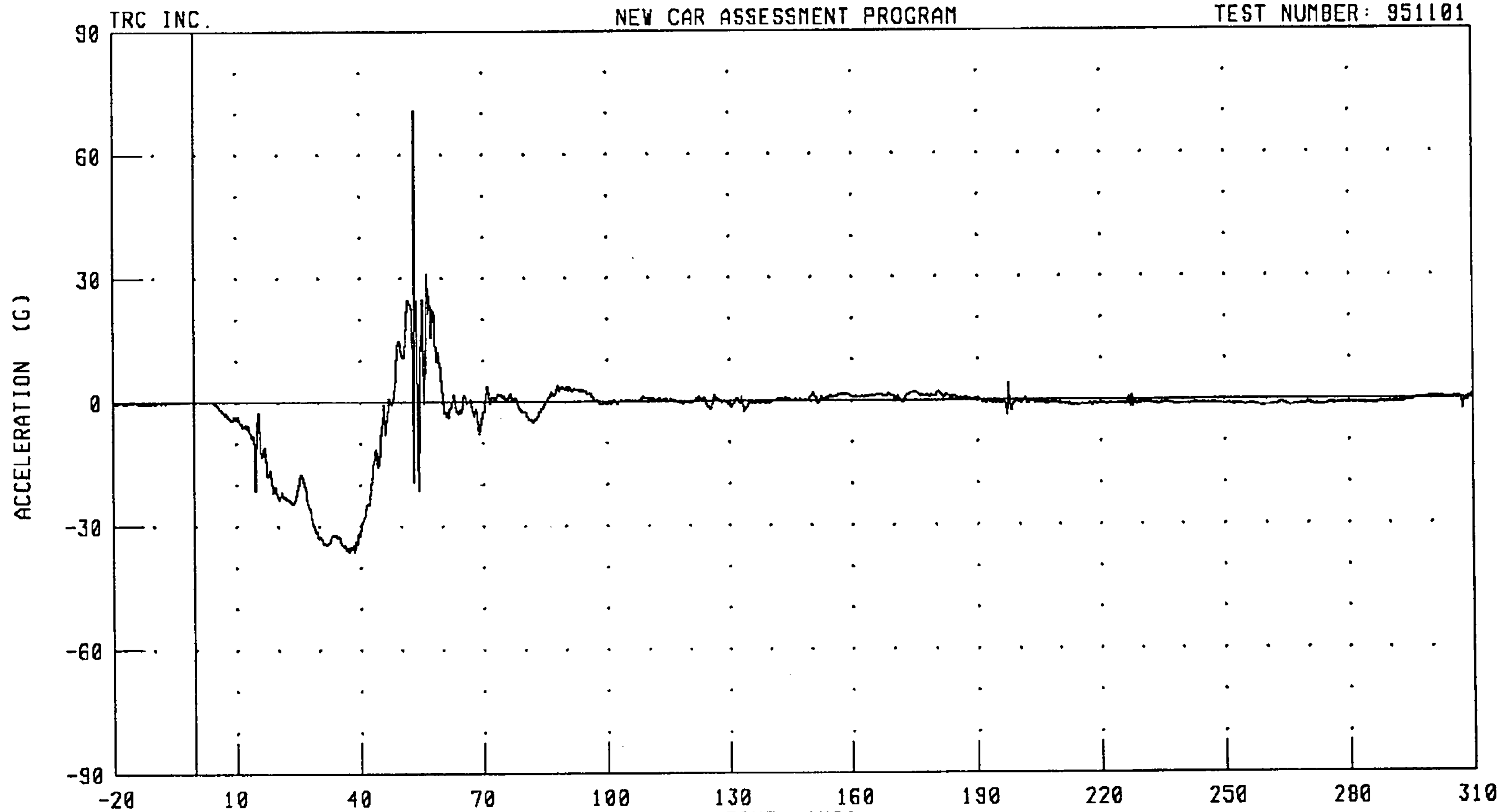
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER RIGHT LOWER TIBIA MOMENT ABOUT Y AXIS
NEW CAR ASSESSMENT PROGRAM

TRC INC. TEST NUMBER: 951101



CHANNEL: ANRYM1 FILTER: CH. CLASS 600 PEAK DATA: 64.22 N·M @ 35.20 MS; -263.59 N·M @ 50.32 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER LEFT FOOT X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM



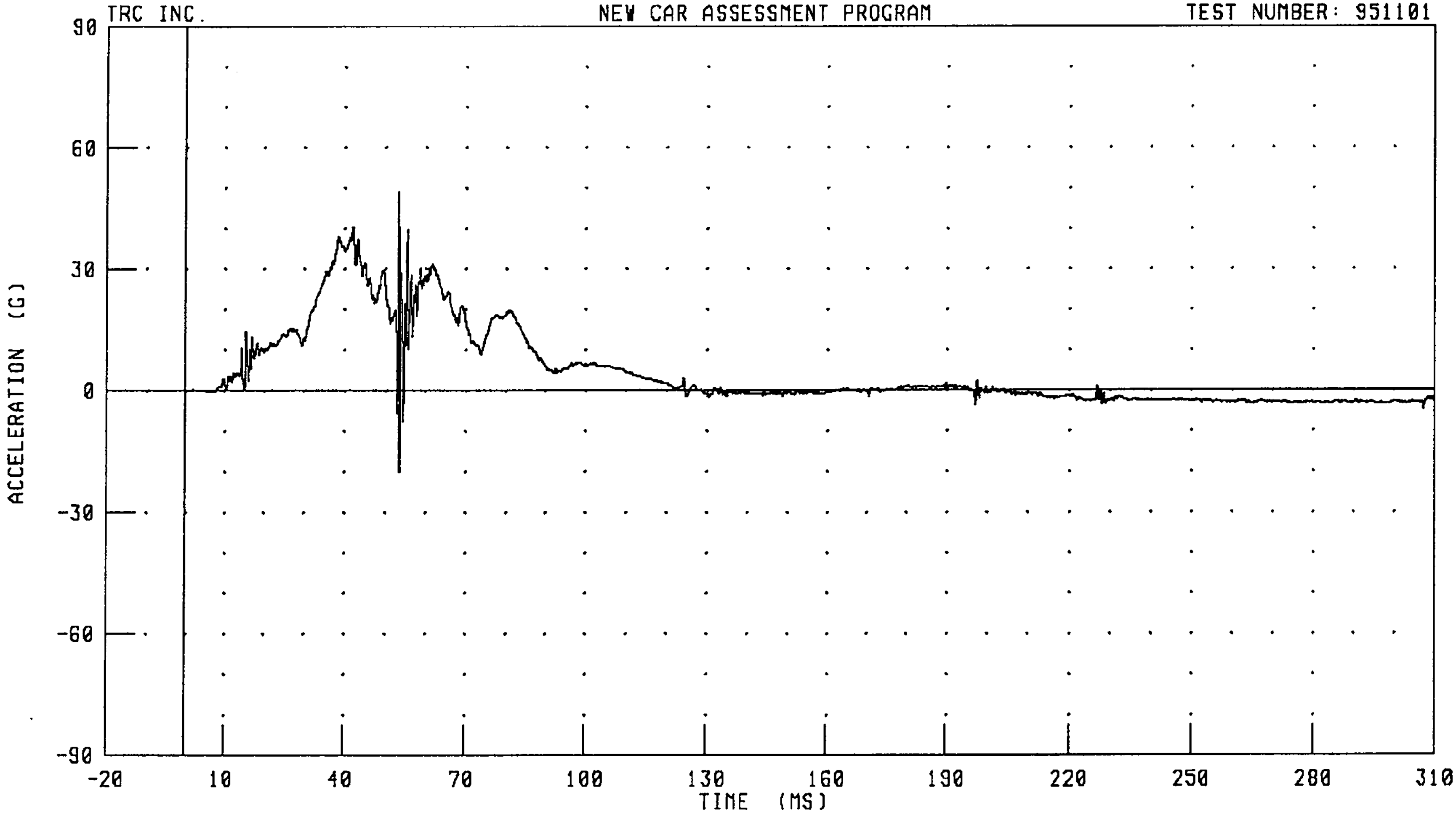
CHANNEL: FTLXG1 FILTER: CH. CLASS 1000

PEAK DATA: 70.70 G @ 53.36 MS; -36.33 G @ 37.44 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER LEFT FOOT Z-AXIS ACCELERATION AT HEEL
NEW CAR ASSESSMENT PROGRAM

TRC INC.

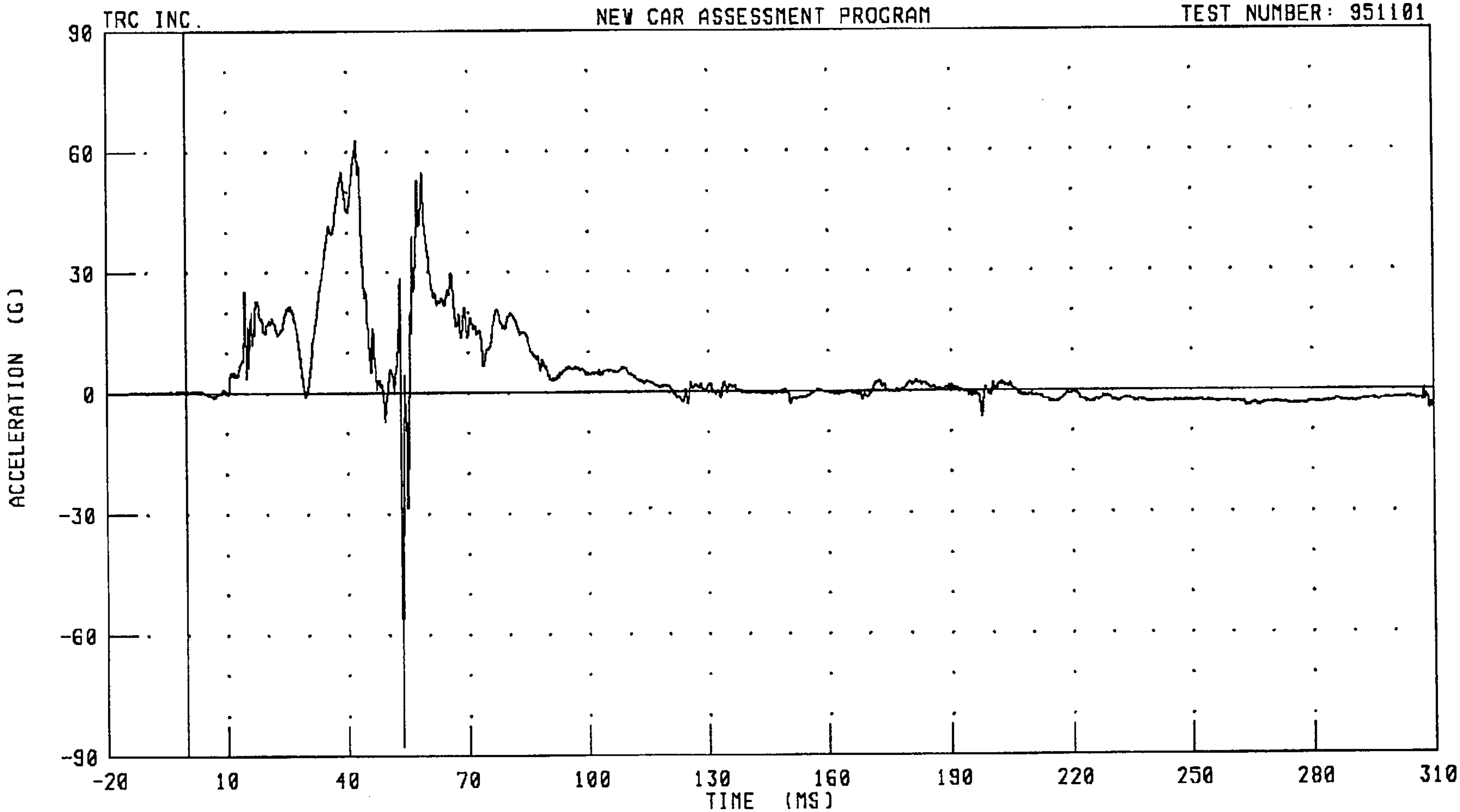
TEST NUMBER: 951101



CHANNEL: FTLZH1 FILTER: CH. CLASS 1000

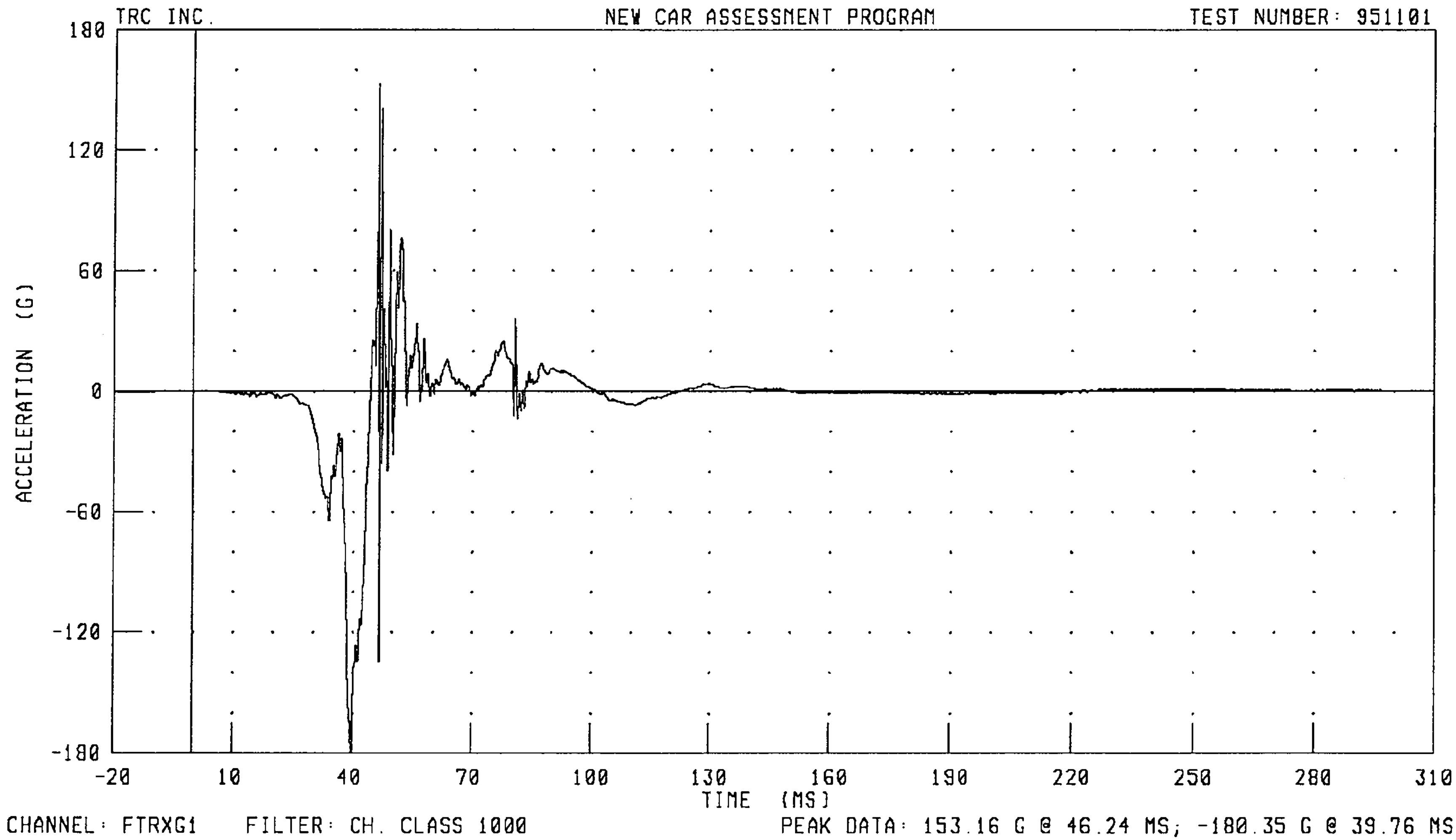
PEAK DATA: 48.98 G @ 53.28 MS; -20.08 G @ 53.60 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER LEFT FOOT Z-AXIS ACCELERATION AT TOE
NEW CAR ASSESSMENT PROGRAM



CHANNEL: FTLZT1 FILTER: CH. CLASS 1000 PEAK DATA: 62.69 G @ 42.40 MS; -87.66 G @ 53.44 MS

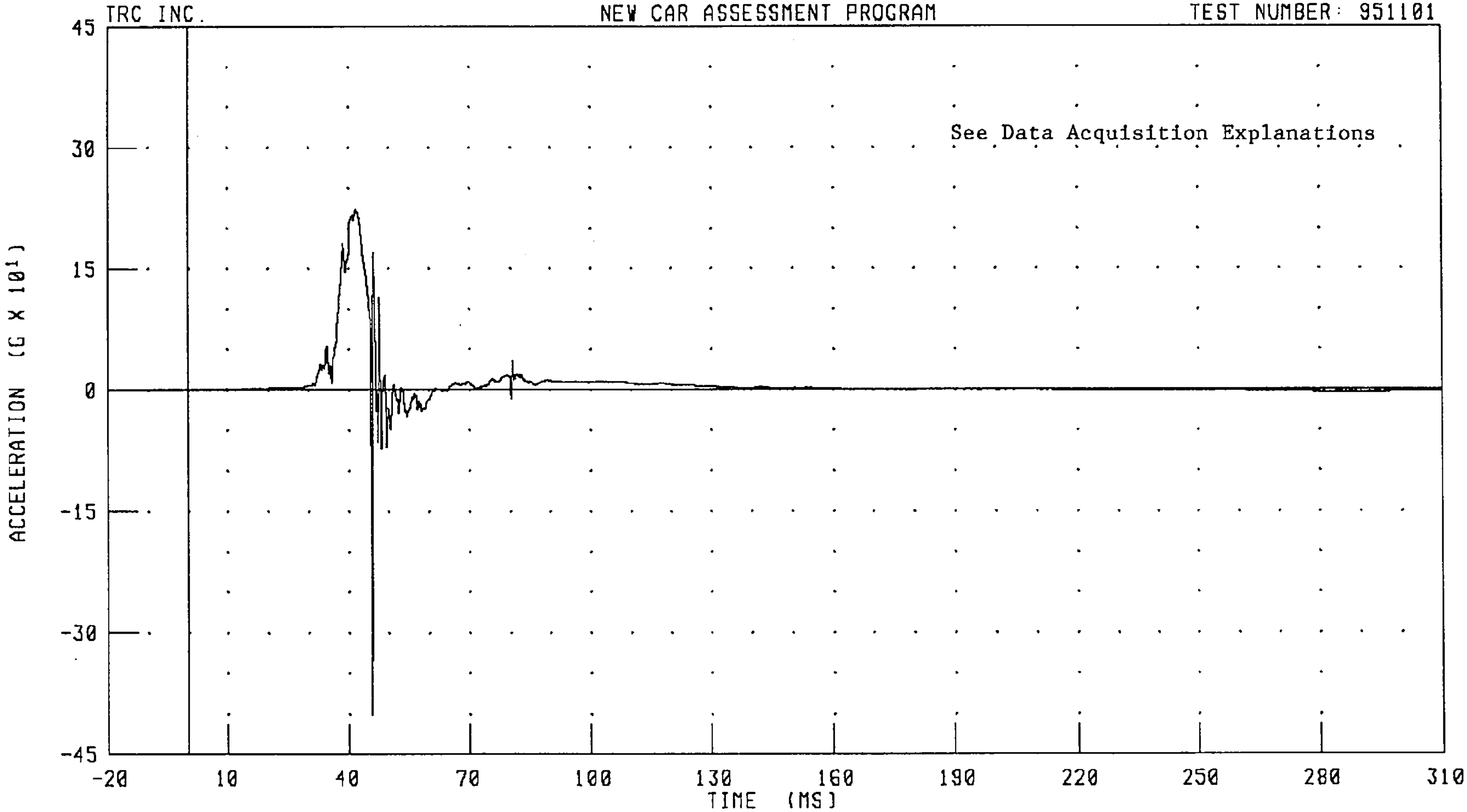
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER RIGHT FOOT X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM



1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER RIGHT FOOT Z-AXIS ACCELERATION AT HEEL
NEW CAR ASSESSMENT PROGRAM

TRC INC.

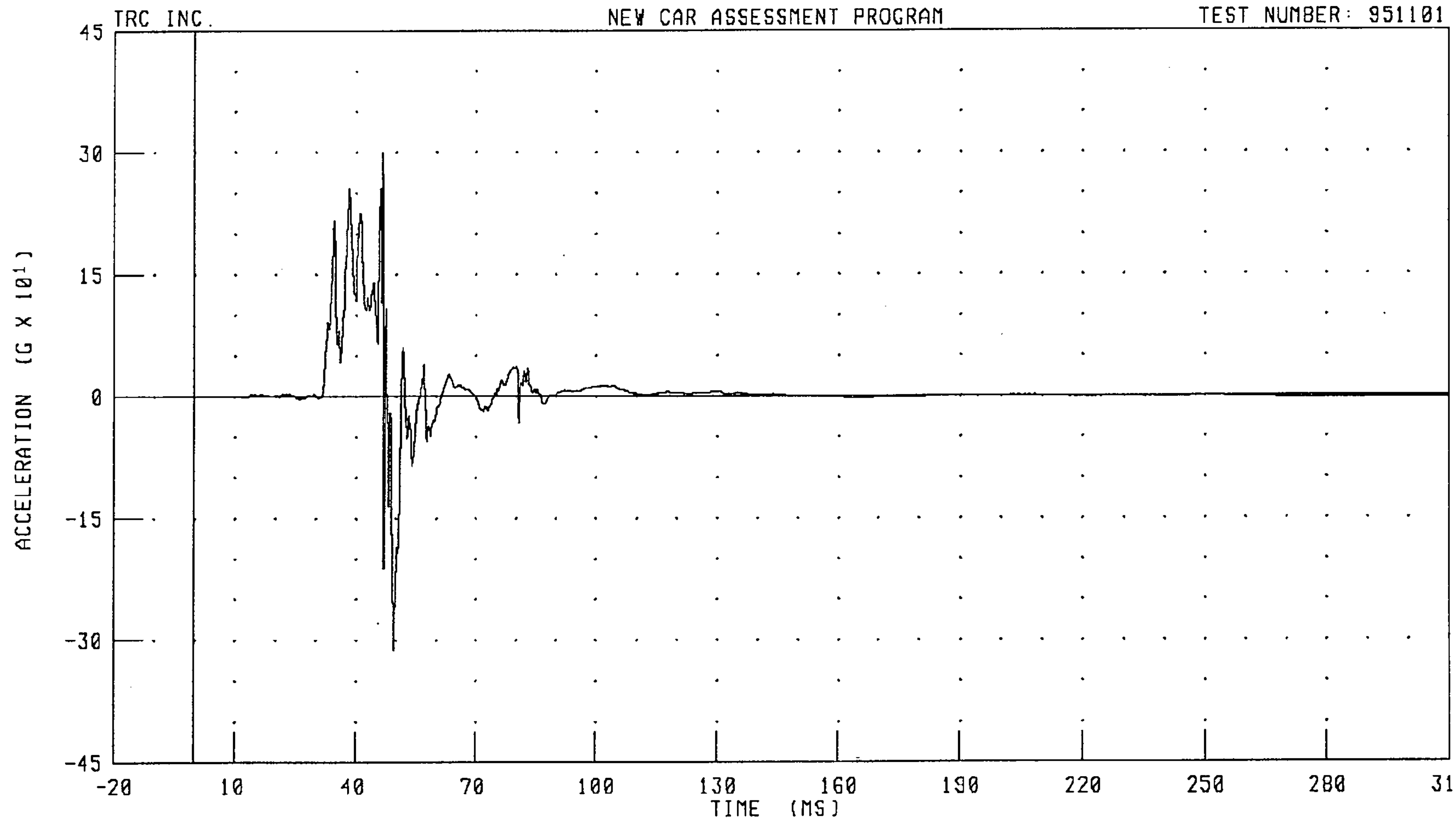
TEST NUMBER: 951101



CHANNEL: FTRZH1 FILTER: CH. CLASS 1000

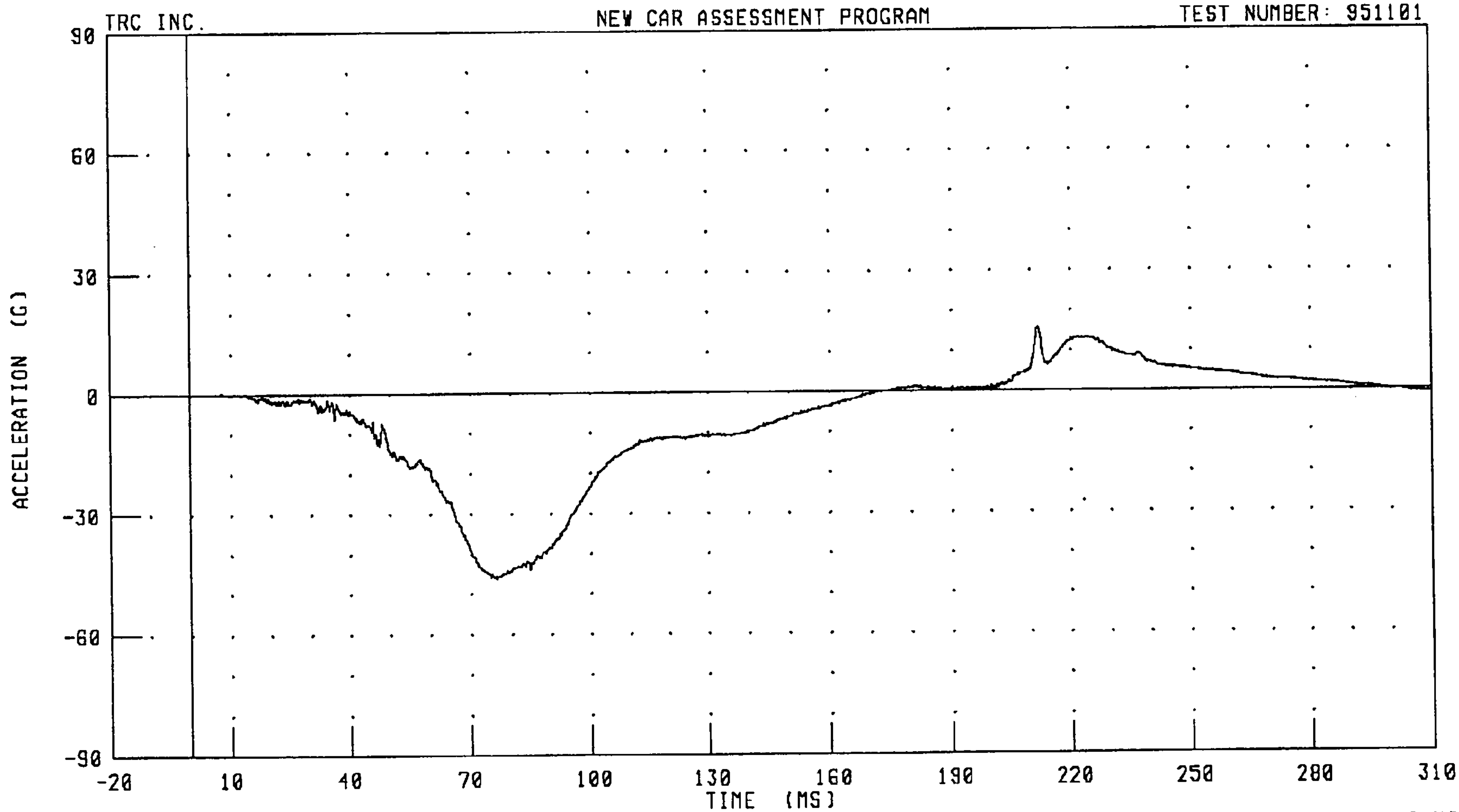
PEAK DATA: 223.25 G @ 42.00 MS; -401.79 G @ 45.92 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER RIGHT FOOT Z-AXIS ACCELERATION AT TOE
NEW CAR ASSESSMENT PROGRAM



CHANNEL: FTRZT1 FILTER: CH. CLASS 1000 PEAK DATA: 300.15 G @ 46.64 MS; -311.97 G @ 49.52 MS

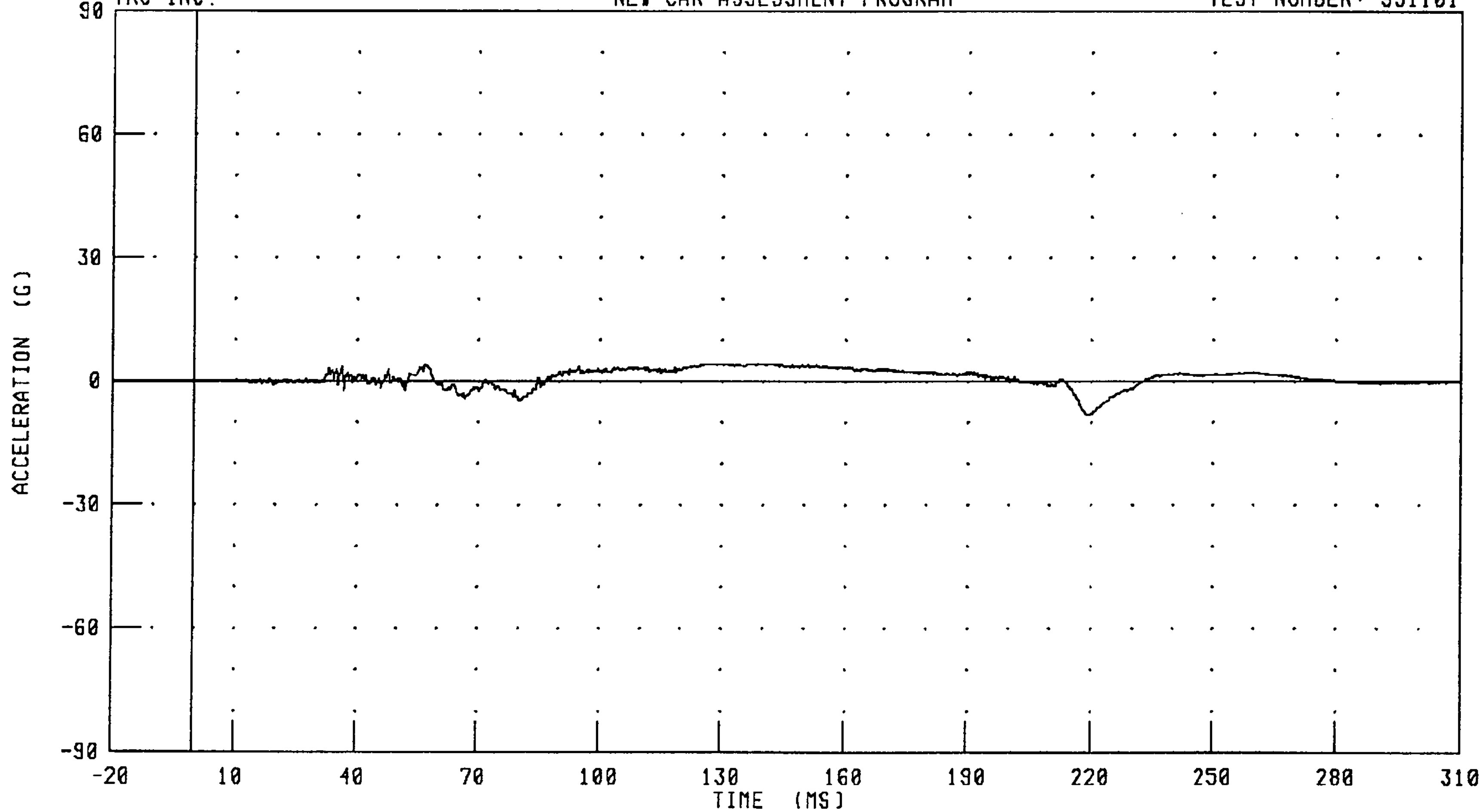
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM



CHANNEL: HEDXG2 FILTER: CH. CLASS 1000 PEAK DATA: 15.83 G @ 211.92 MS; -46.24 G @ 76.48 MS

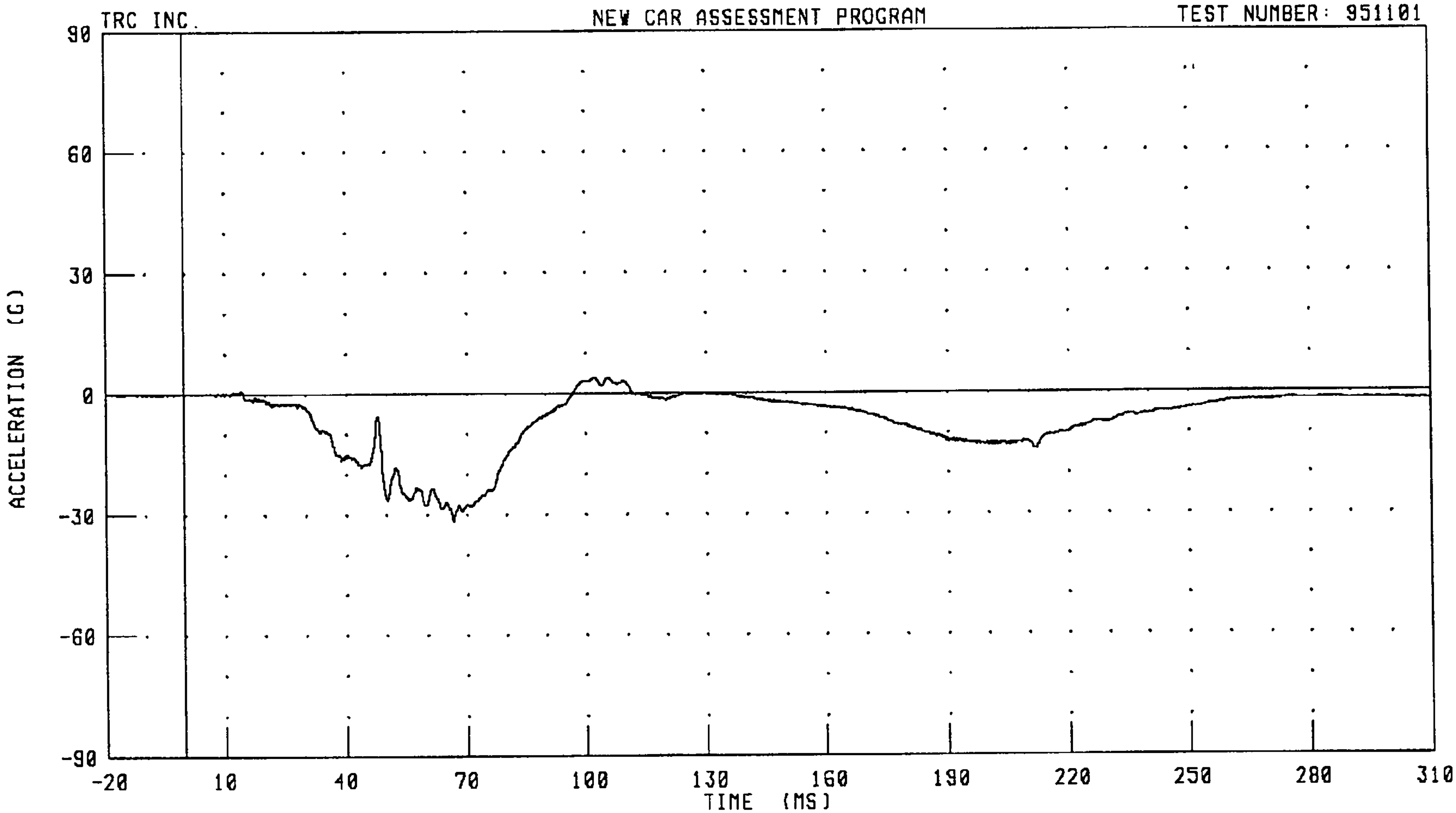
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD Y-AXIS ACCELERATION

TRC INC. NEW CAR ASSESSMENT PROGRAM TEST NUMBER: 951101



CHANNEL: HEDYG2 FILTER: CH. CLASS 1000 PEAK DATA: 4.38 G @ 138.72 MS; -8.04 G @ 218.96 MS

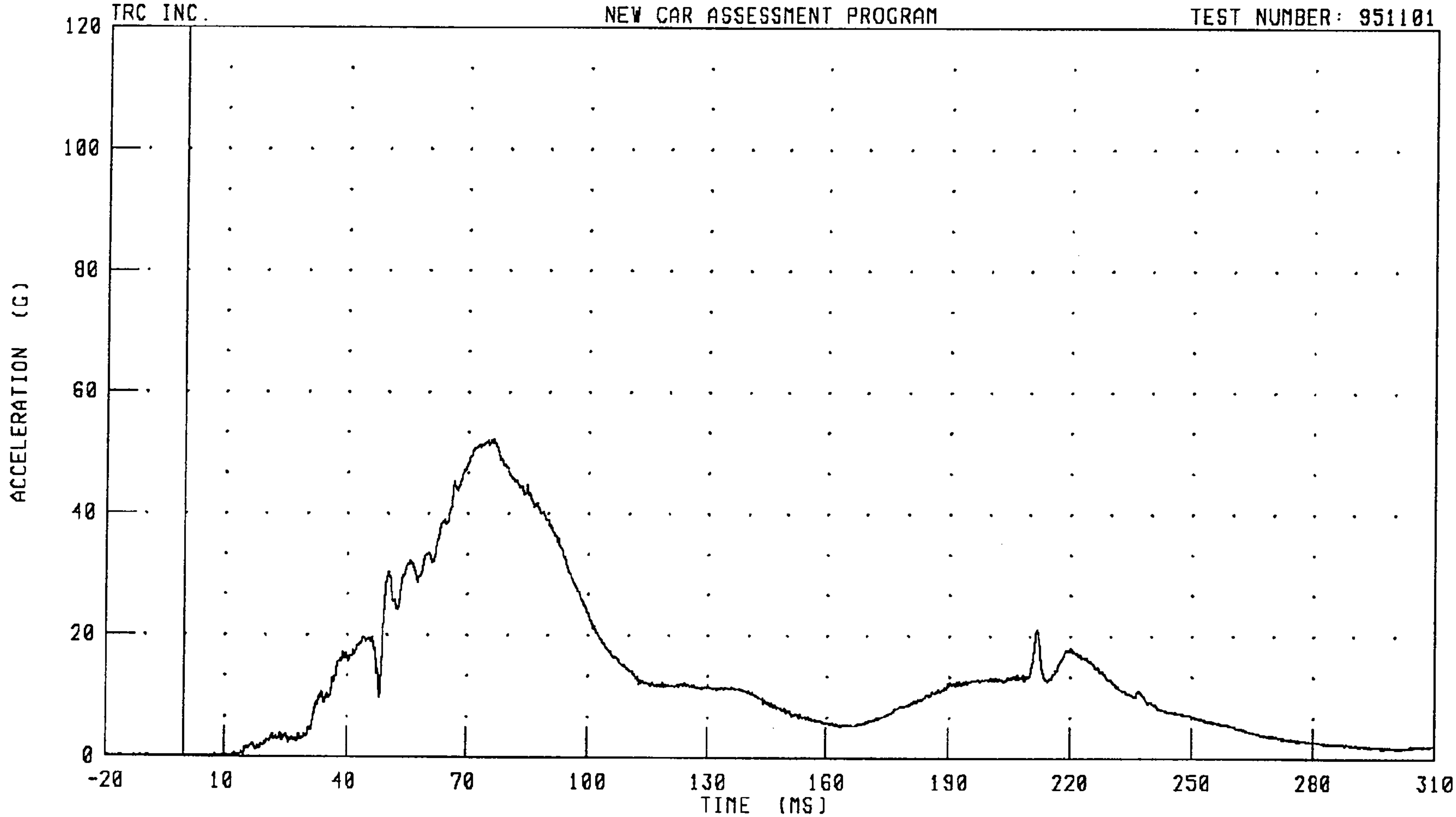
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD Z-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM



CHANNEL: HEDZG2 FILTER: CH. CLASS 1000 PEAK DATA: 3.91 G @ 102.40 MS; -31.66 G @ 66.72 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD RESULTANT ACCELERATION
NEW CAR ASSESSMENT PROGRAM

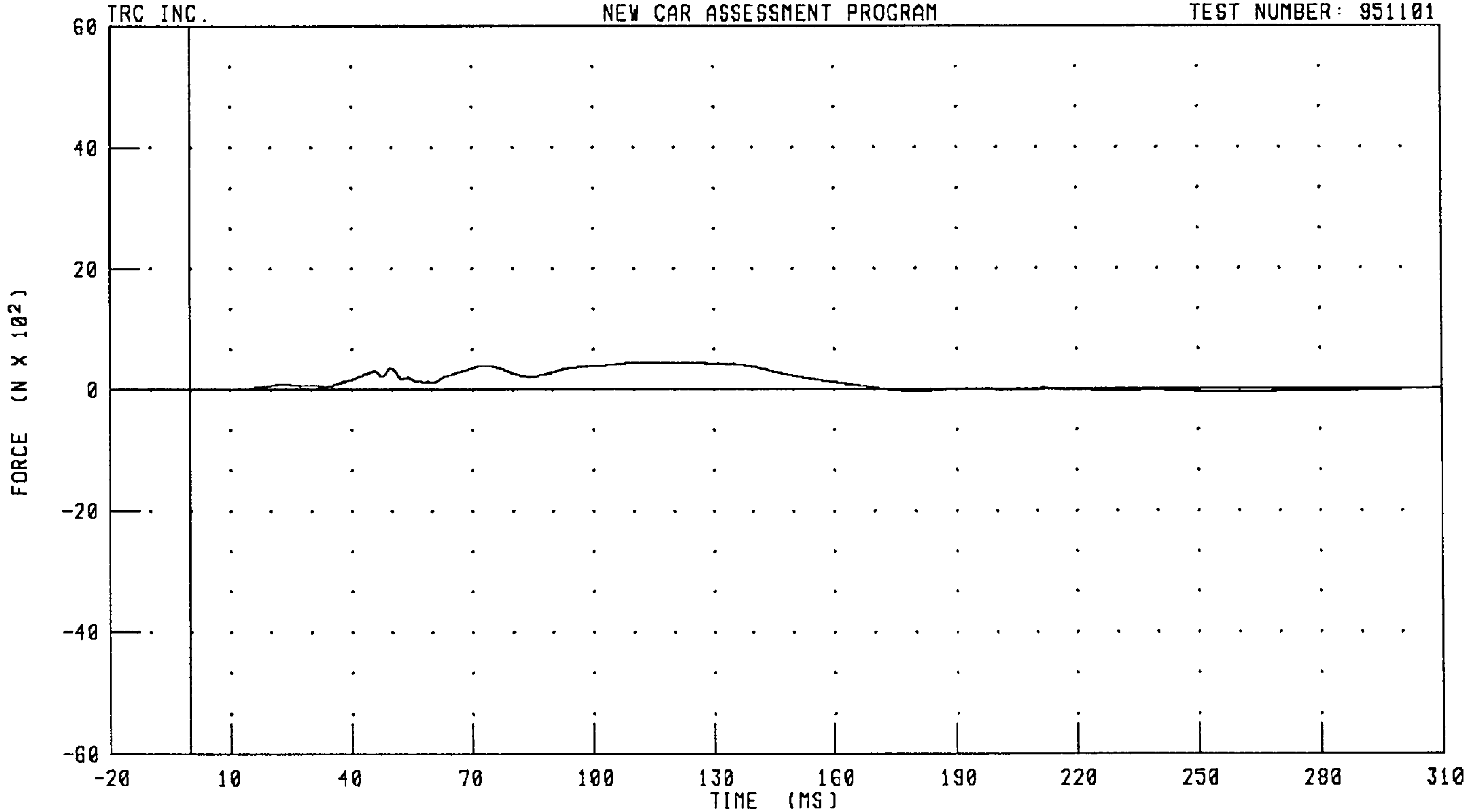
TEST NUMBER: 951101



CHANNEL: HEDRG2 FILTER: CH. CLASS 1000

PEAK DATA: 52.16 G @ 76.48 MS; 0.09 G @ -5.76 MS

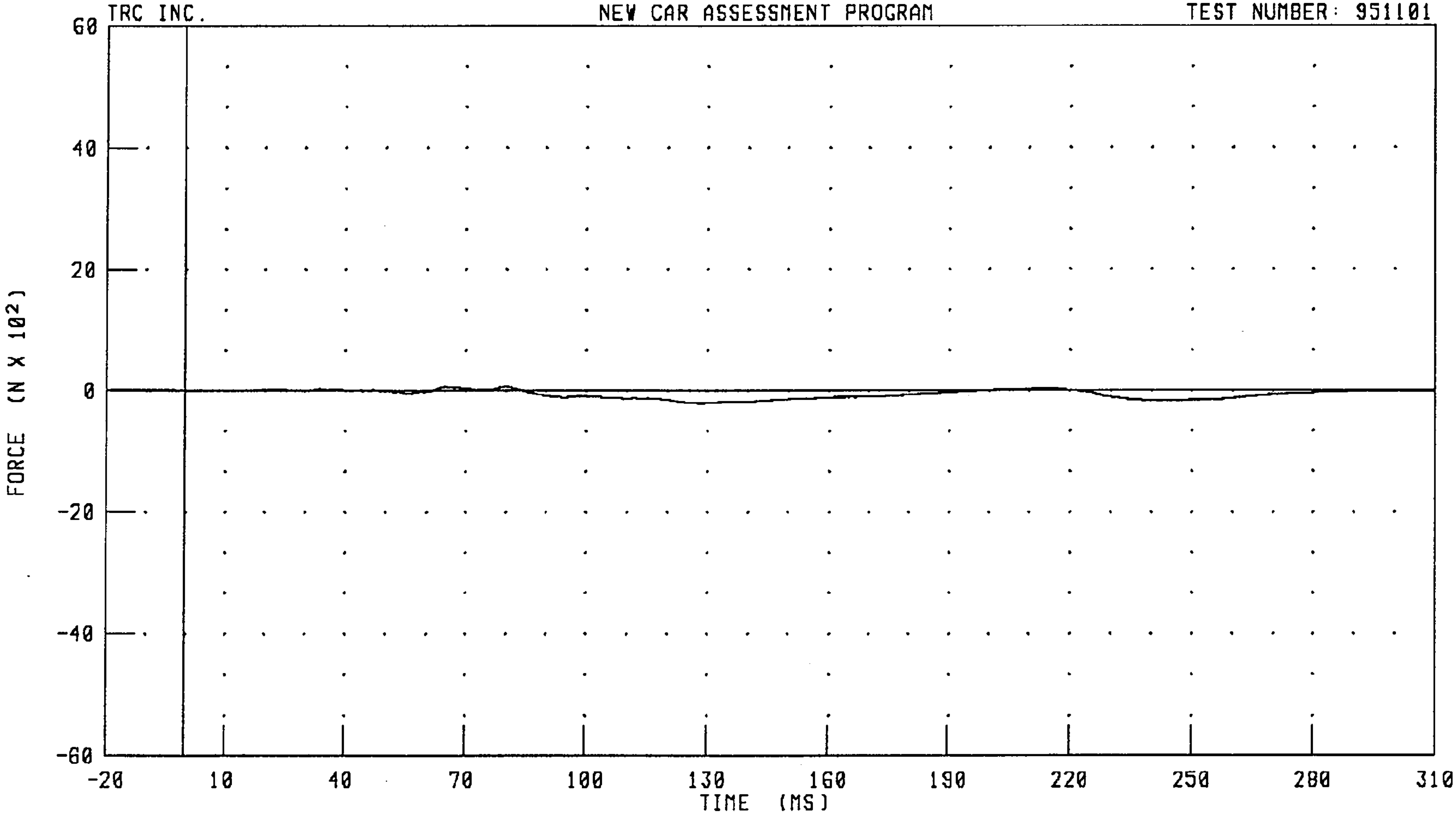
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK X-AXIS SHEAR FORCE
NEW CAR ASSESSMENT PROGRAM



CHANNEL: NEKXF2 FILTER: CH. CLASS 1000 PEAK DATA: 448.72 N @ 121.28 MS; -55.71 N @ 254.72 MS

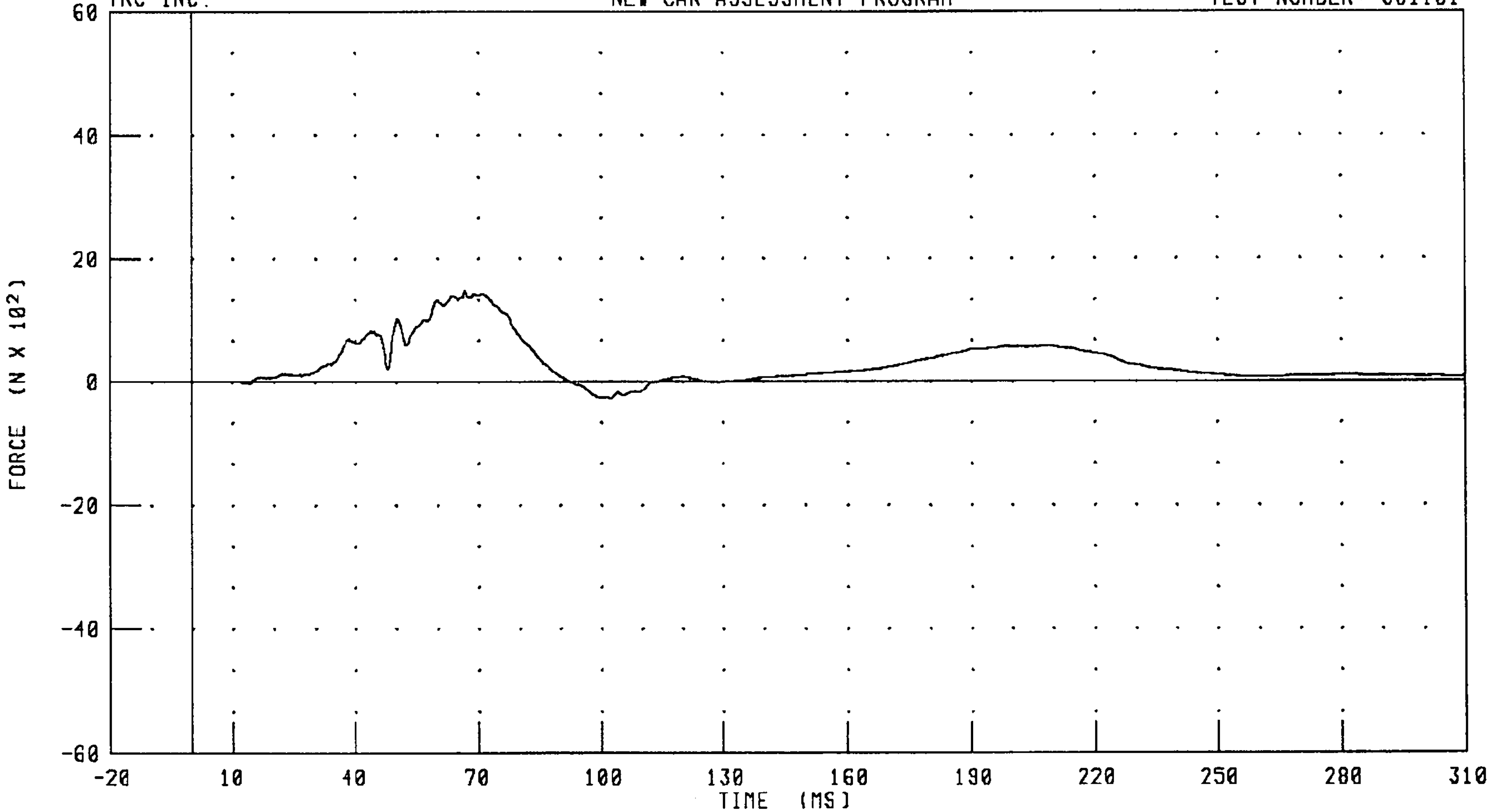
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK Y-AXIS SHEAR FORCE
NEW CAR ASSESSMENT PROGRAM

TRC INC. TEST NUMBER: 951101



CHANNEL: NEKYF2 FILTER: CH. CLASS 1000 PEAK DATA: 67.68 N @ 64.88 MS; -214.70 N @ 127.68 MS

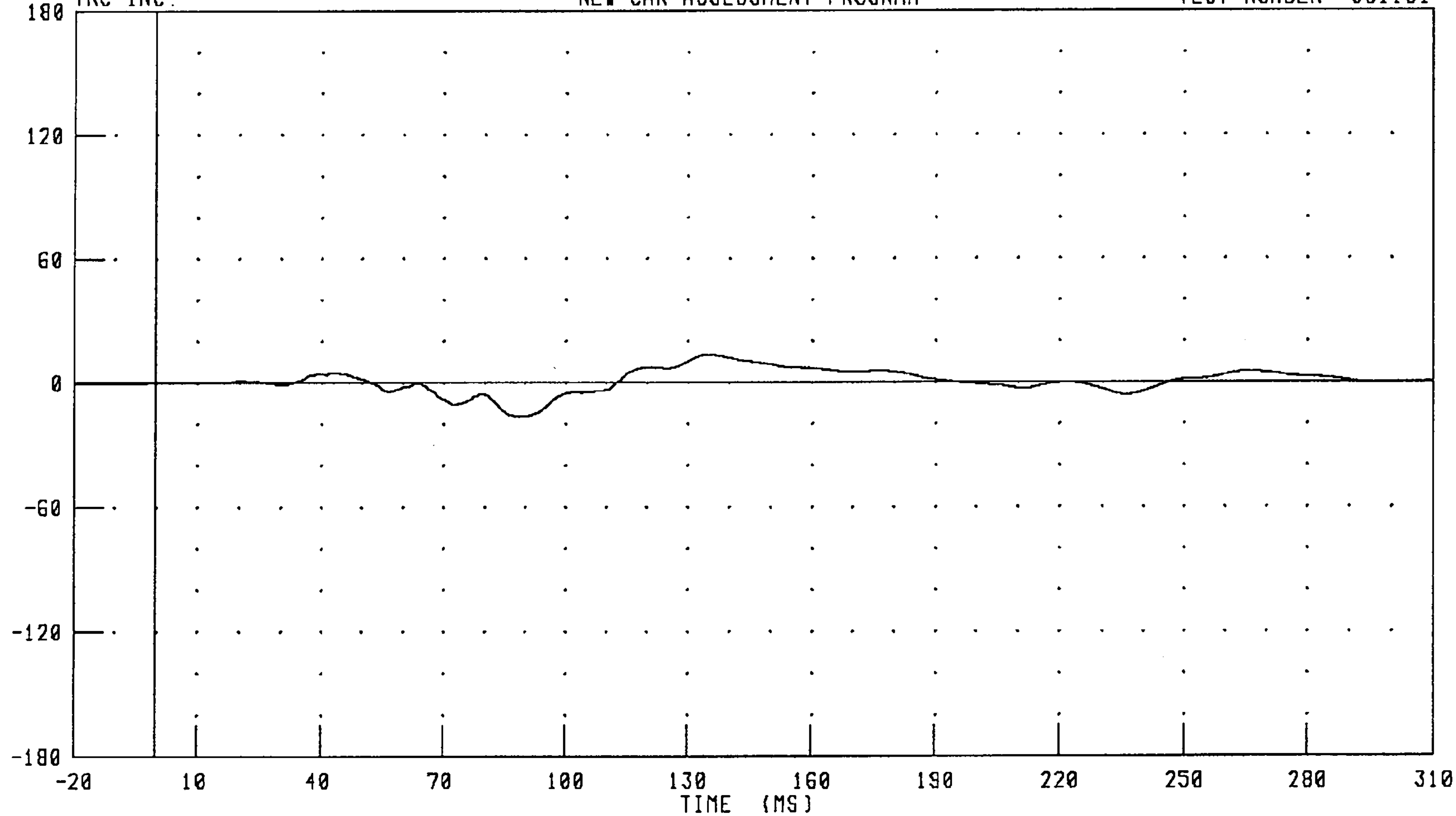
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK Z-AXIS AXIAL FORCE
TRC INC. NEW CAR ASSESSMENT PROGRAM TEST NUMBER: 951101



CHANNEL: NEKZF2 FILTER: CH. CLASS 1000 PEAK DATA: 1469.77 N @ 66.72 MS; -265.14 N @ 102.00 MS

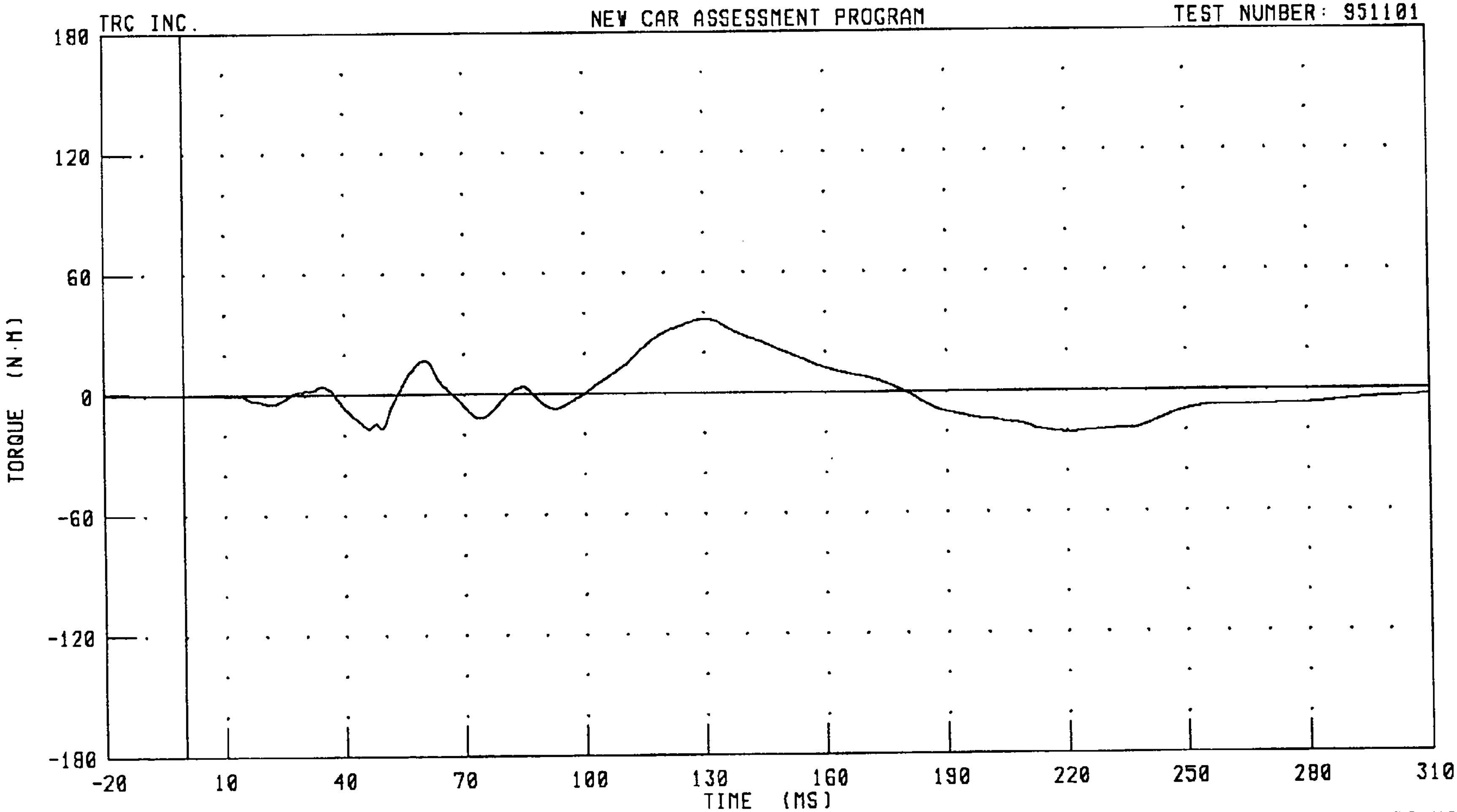
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK MOMENT ABOUT X AXIS
NEW CAR ASSESSMENT PROGRAM

TRC INC. TEST NUMBER: 951101



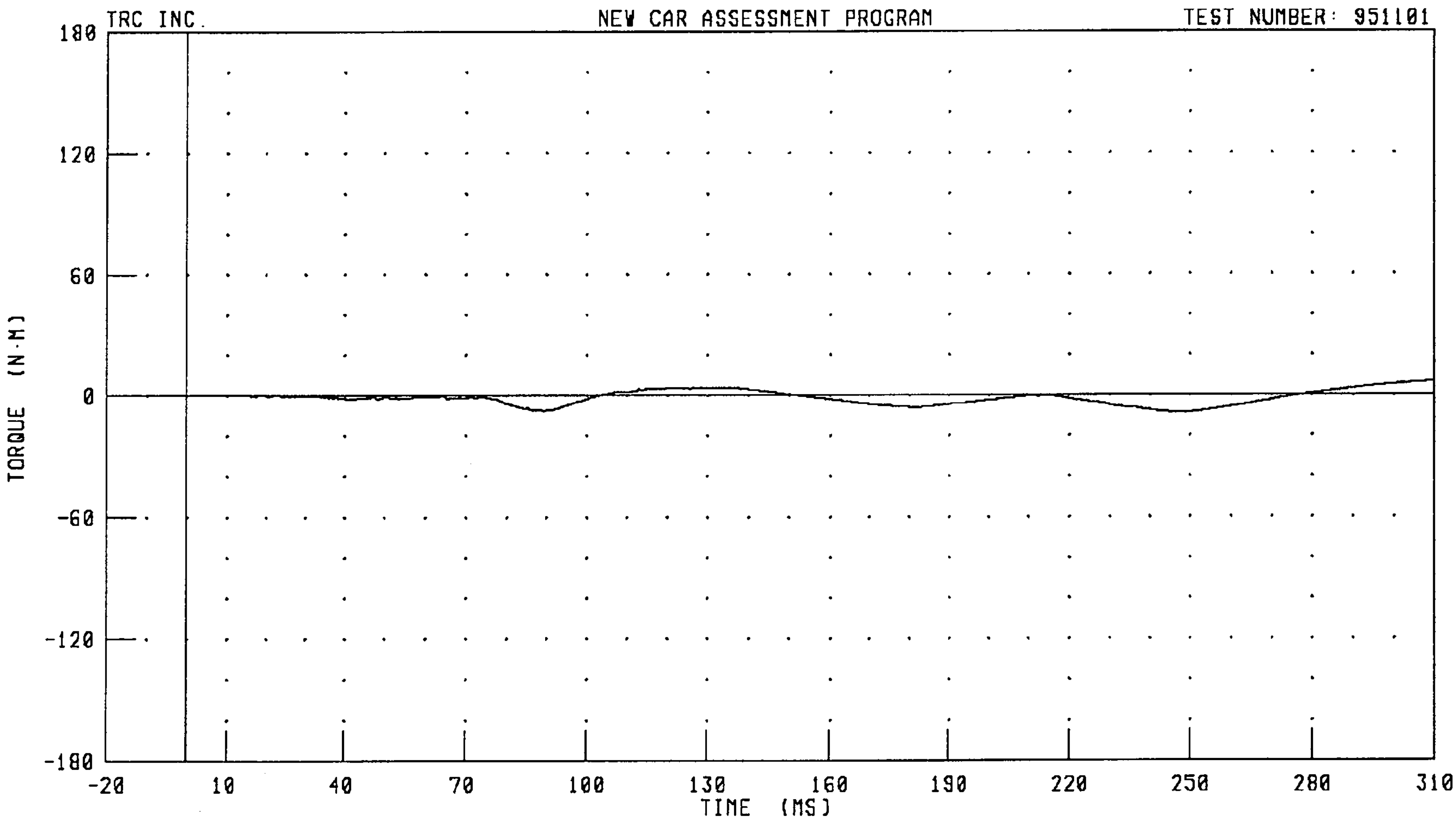
CHANNEL: NEKXM2 FILTER: CH. CLASS 600 PEAK DATA: 13.22 N·M @ 135.12 MS; -16.46 N·M @ 88.40 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK MOMENT ABOUT Y AXIS
NEW CAR ASSESSMENT PROGRAM

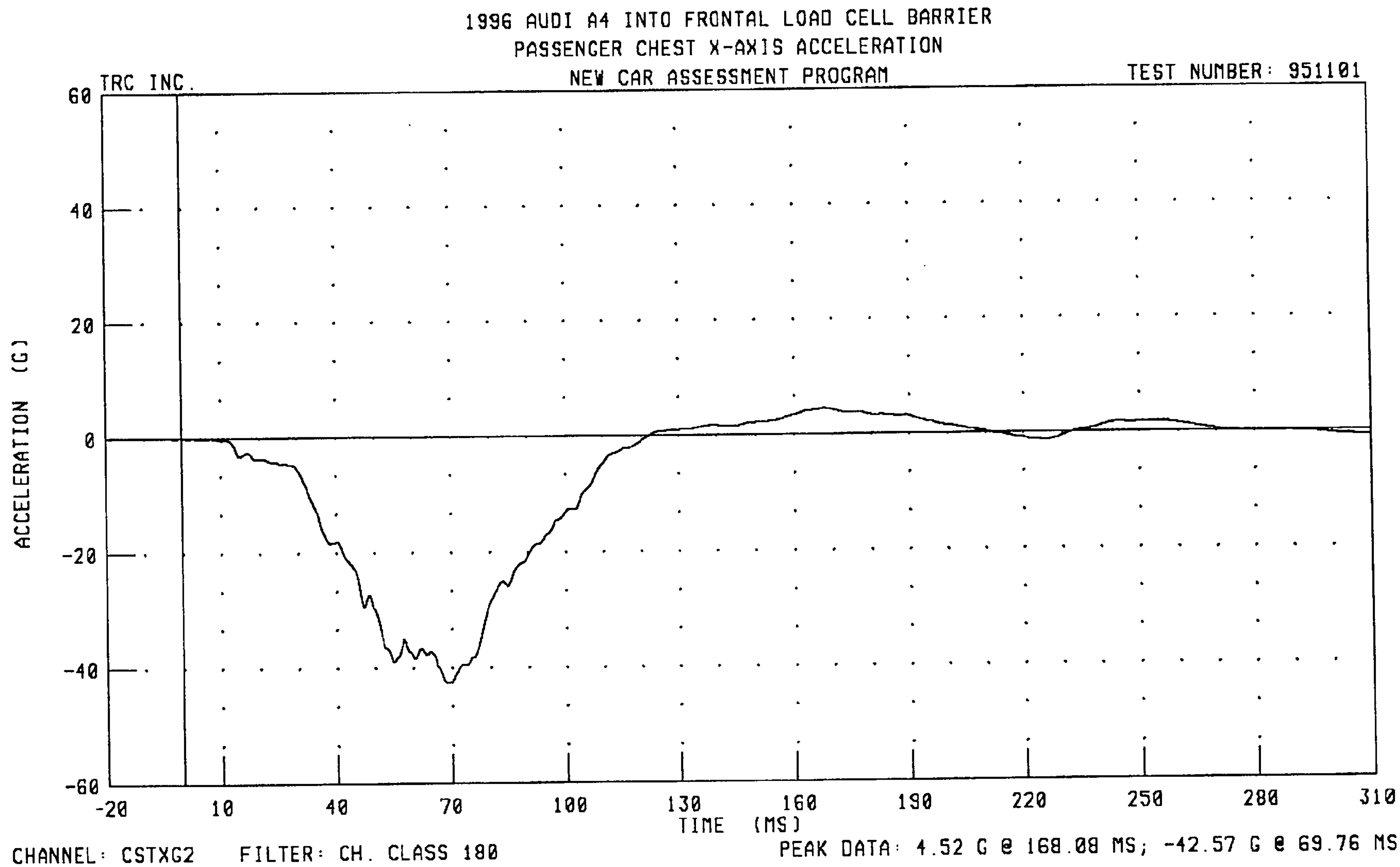


CHANNEL: NEKYM2 FILTER: CH. CLASS 600 PEAK DATA: 36.77 N·M @ 129.44 MS; -20.61 N·M @ 219.36 MS

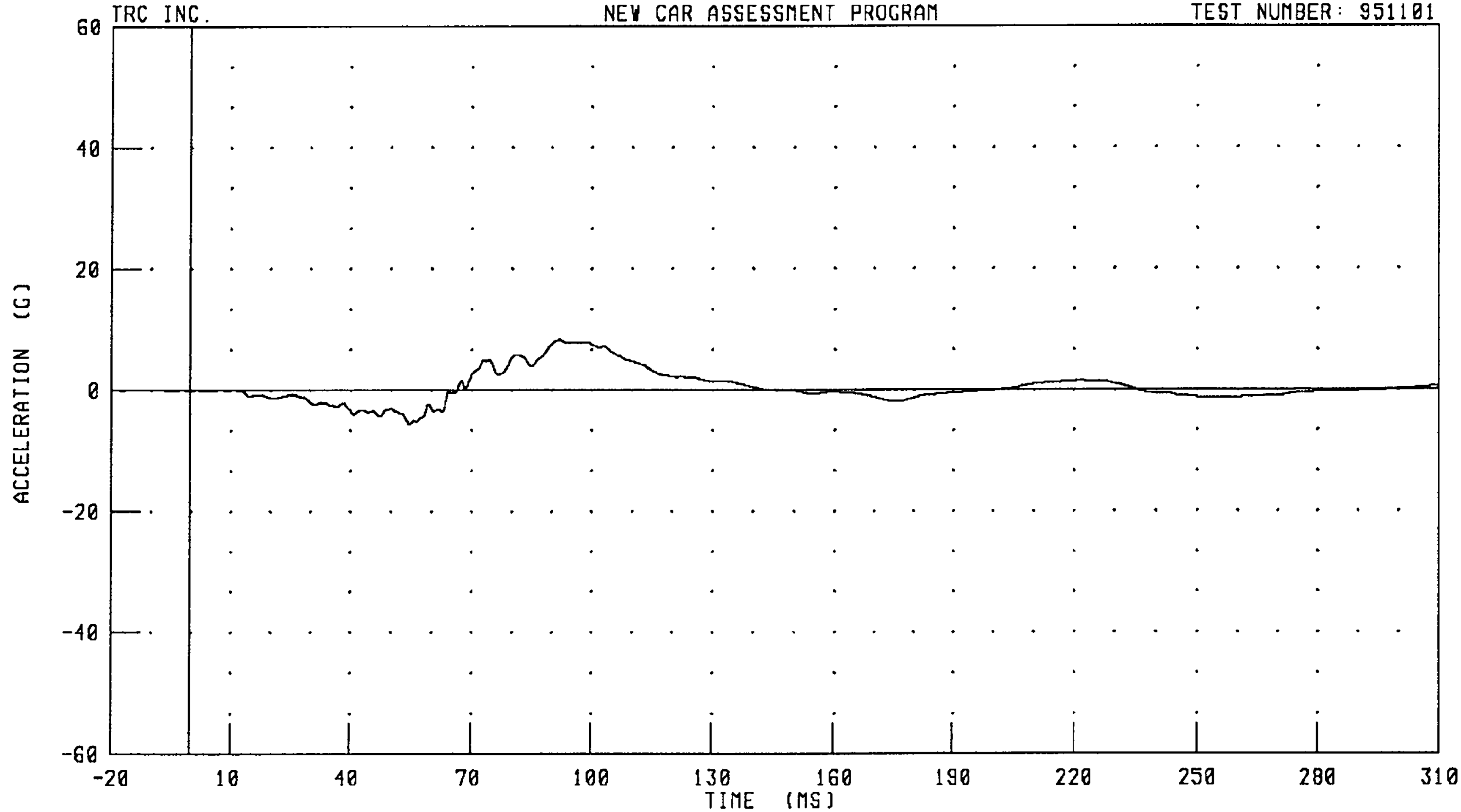
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK MOMENT ABOUT Z AXIS
NEW CAR ASSESSMENT PROGRAM



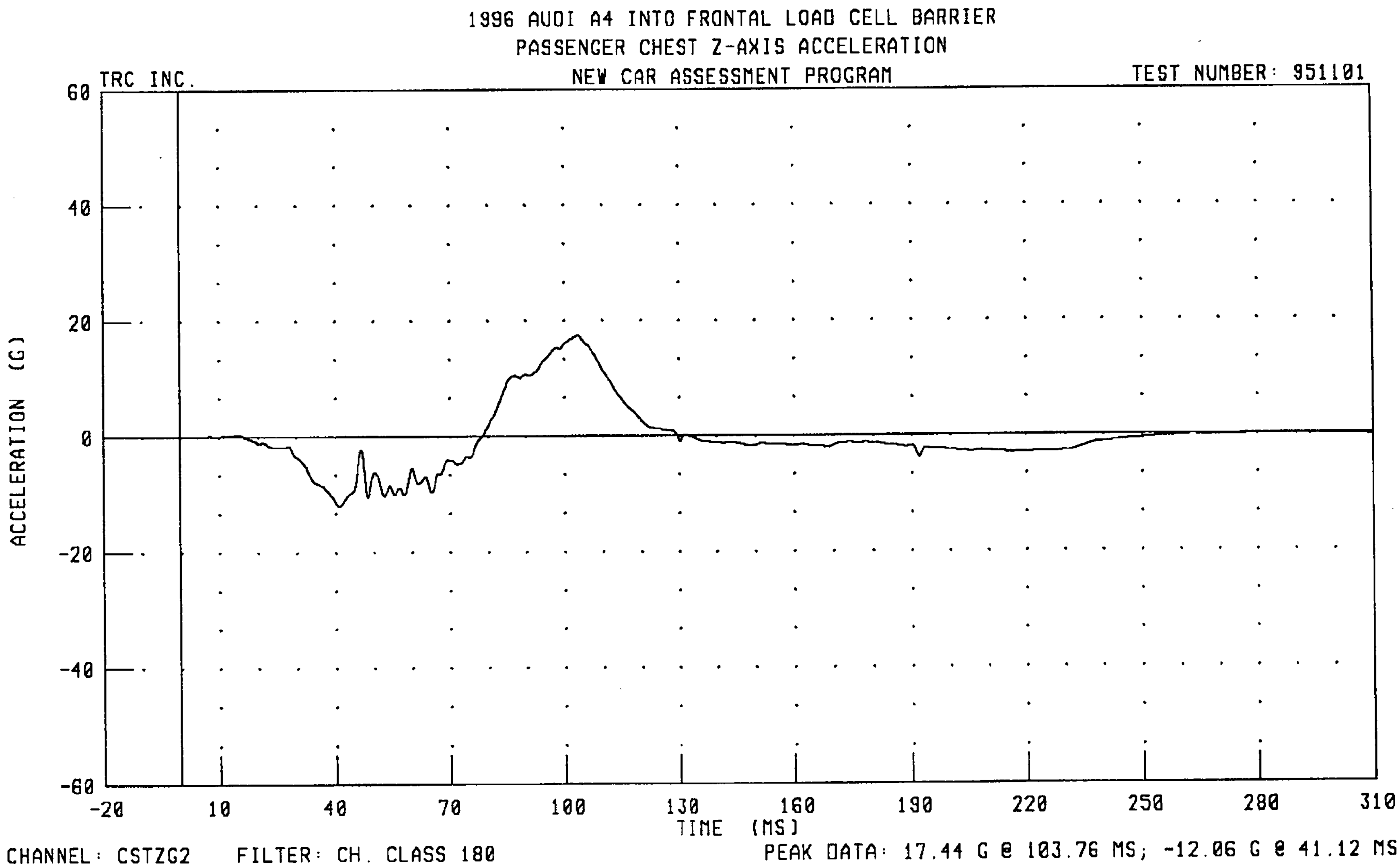
CHANNEL: NEKZM2 FILTER: CH. CLASS 600 PEAK DATA: 6.57 N·M @ 309.68 MS; -8.56 N·M @ 247.84 MS


1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM
TEST NUMBER: 951101
TRC INC.
ACCELERATION (G)
60
40
20
0
-20
-40
-60
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: CSTXG2
FILTER: CH. CLASS 180
PEAK DATA: 4.52 G @ 168.08 MS; -42.57 G @ 69.76 MS

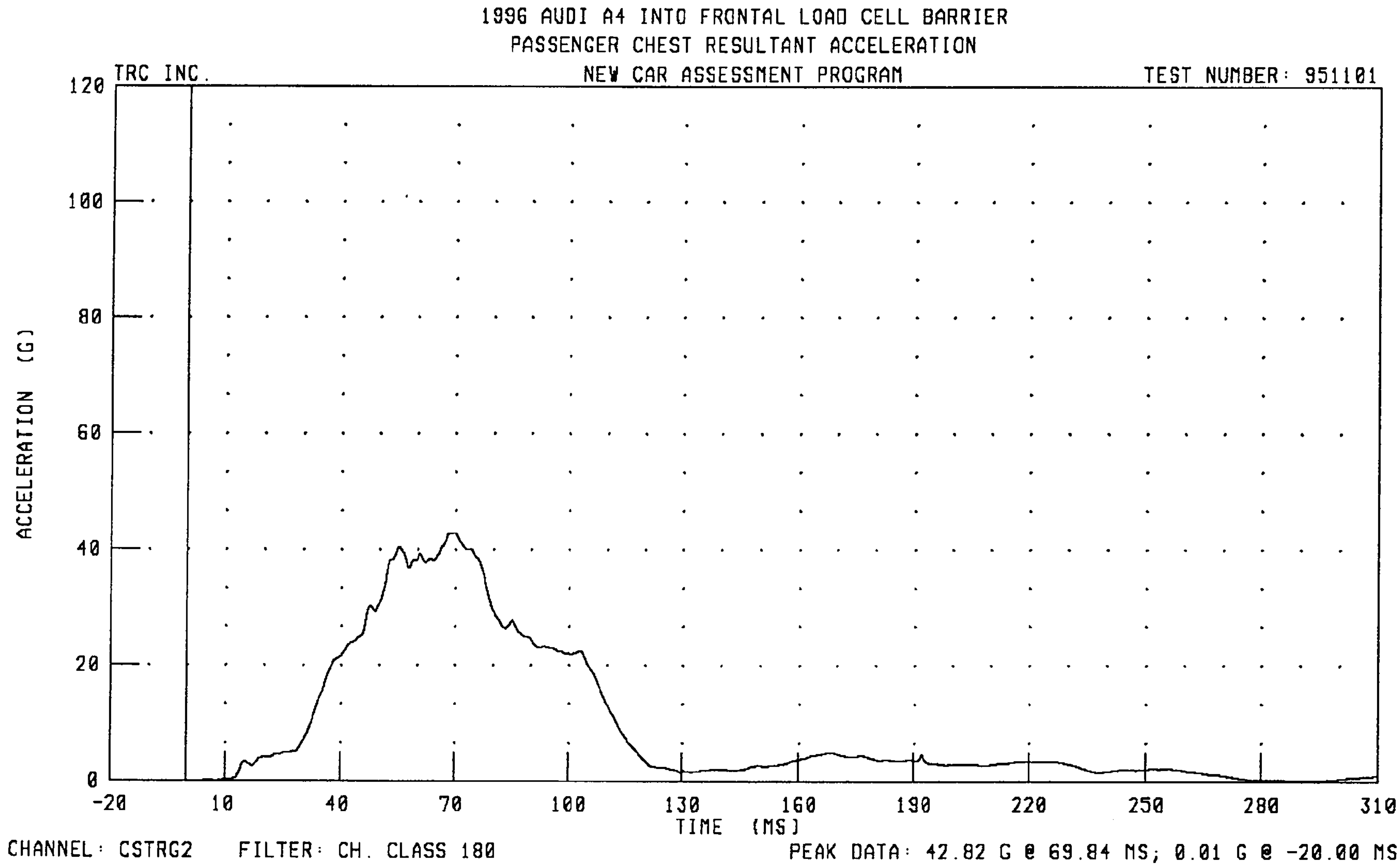
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST Y-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM



CHANNEL: CSTYG2 FILTER: CH. CLASS 180 PEAK DATA: 8.24 G @ 92.16 MS; -5.56 G @ 54.64 MS

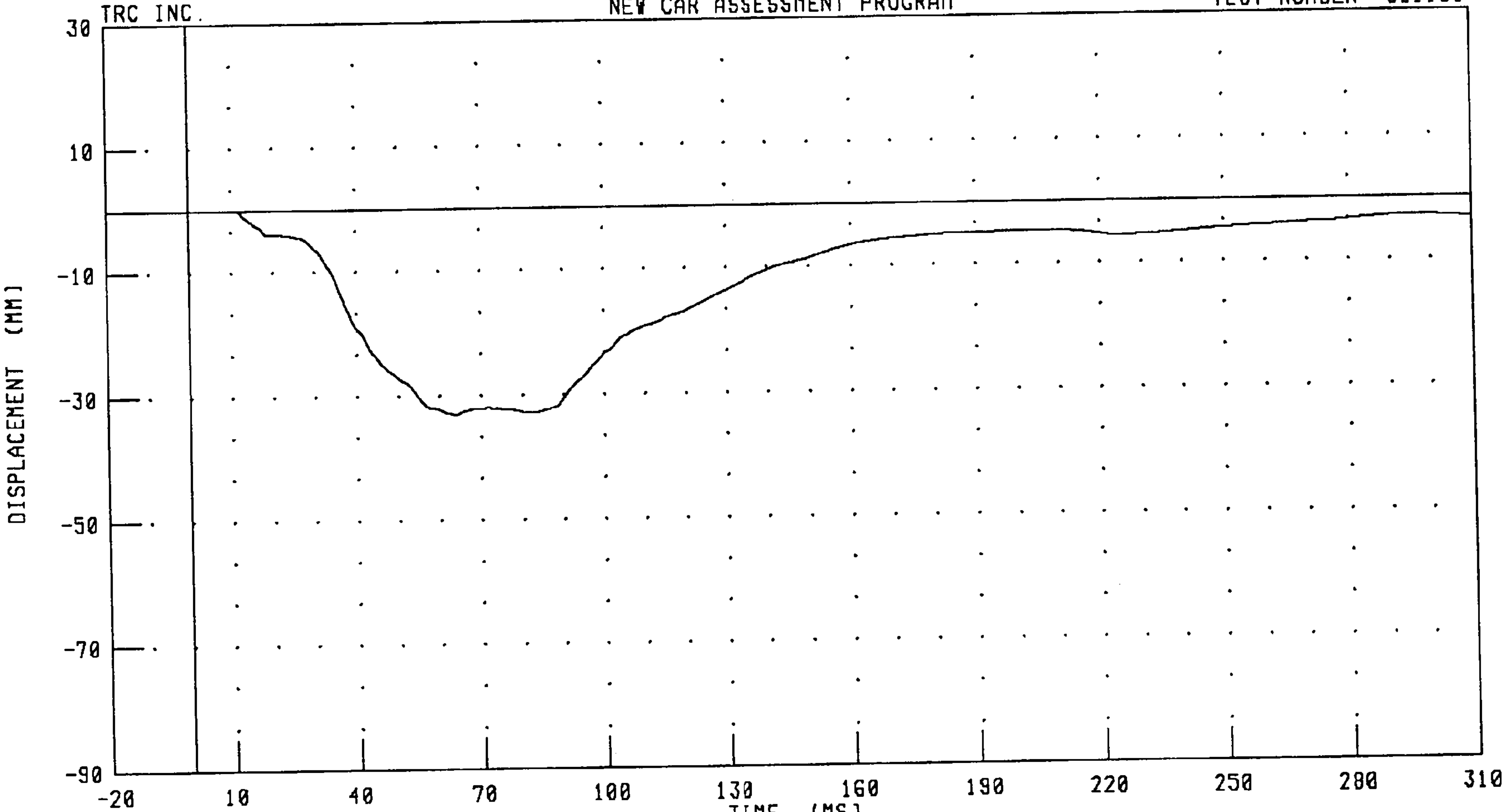

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST Z-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM
TRC INC.
TEST NUMBER: 951101
ACCELERATION (G)
60
40
20
0
-20
-40
-60
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: CSTZG2
FILTER: CH. CLASS 180
PEAK DATA: 17.44 G @ 103.76 MS; -12.06 G @ 41.12 MS

951101


1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST RESULTANT ACCELERATION
NEW CAR ASSESSMENT PROGRAM
TRC INC.
TEST NUMBER: 951101
ACCELERATION (G)
120
100
80
60
40
20
0
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: CSTRG2 FILTER: CH. CLASS 180
PEAK DATA: 42.82 G @ 69.84 MS; 0.01 G @ -20.00 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST DEFLECTION
NEW CAR ASSESSMENT PROGRAM

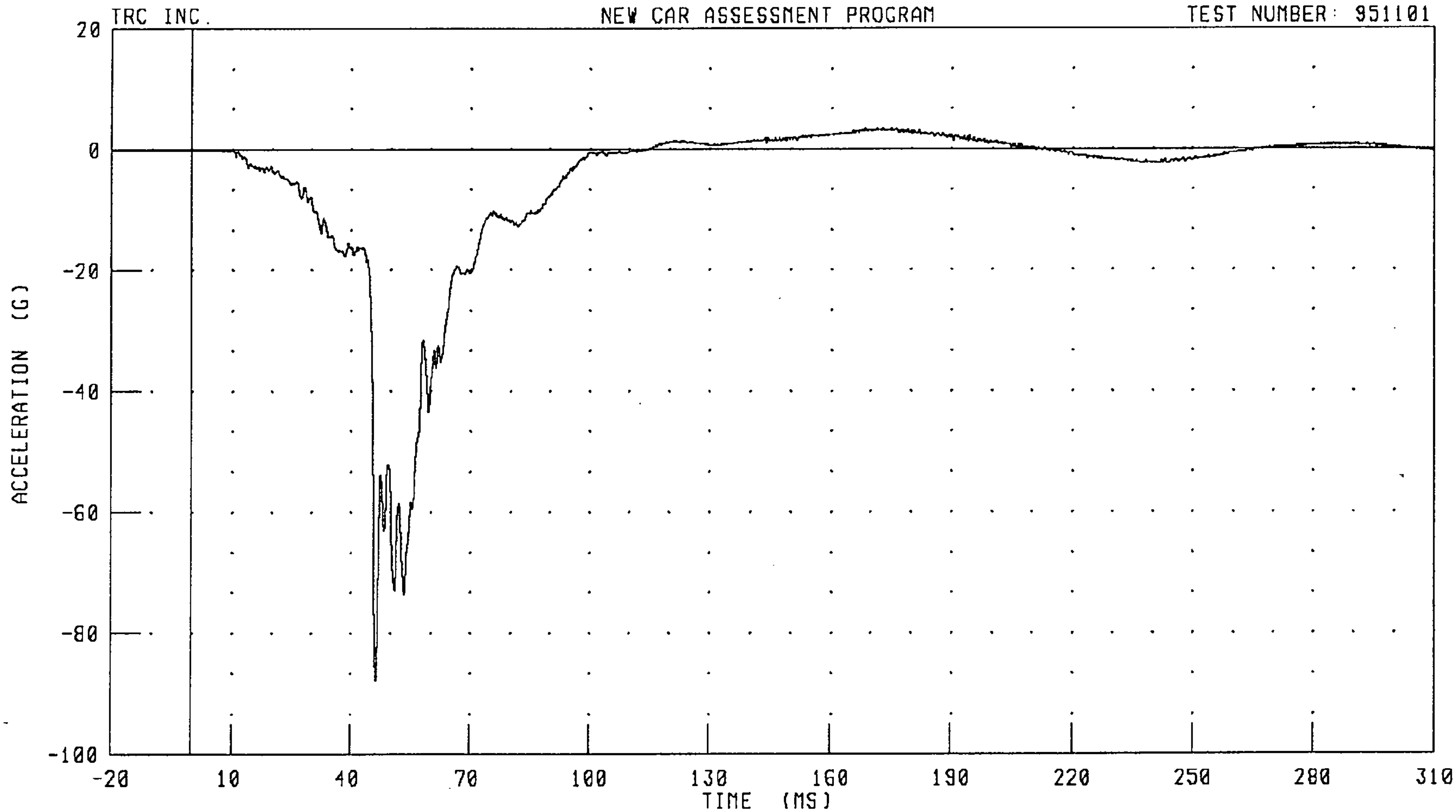
TEST NUMBER: 951101



CHANNEL: CSTXD2 FILTER: CH. CLASS 180

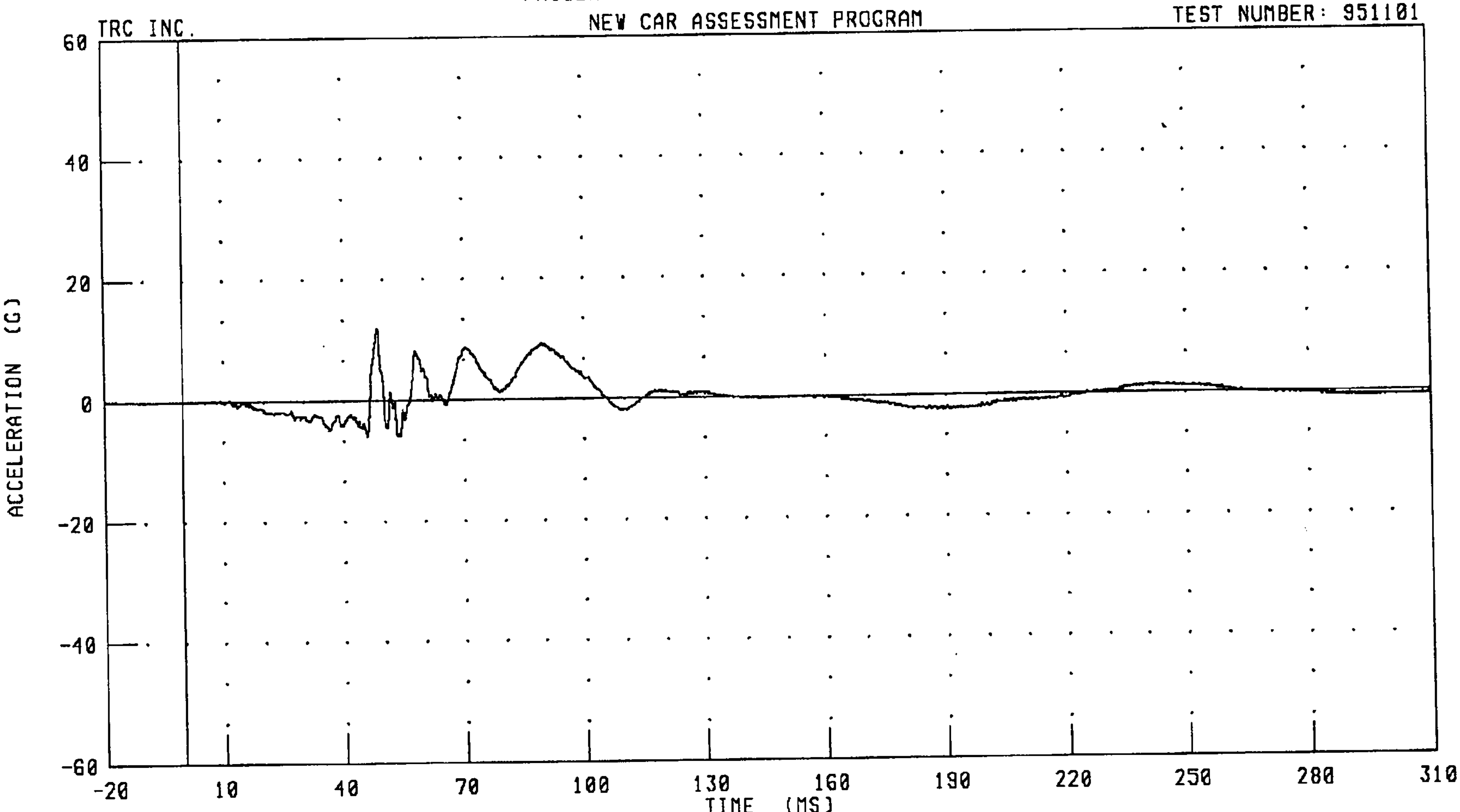
PEAK DATA: 0.01 MM @ -6.80 MS; -33.13 MM @ 63.92 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER PELVIS X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM



CHANNEL: PEVXG2 FILTER: CH. CLASS 1000 PEAK DATA: 3.33 G @ 168.64 MS; -87.85 G @ 46.40 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER PELVIS Y-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

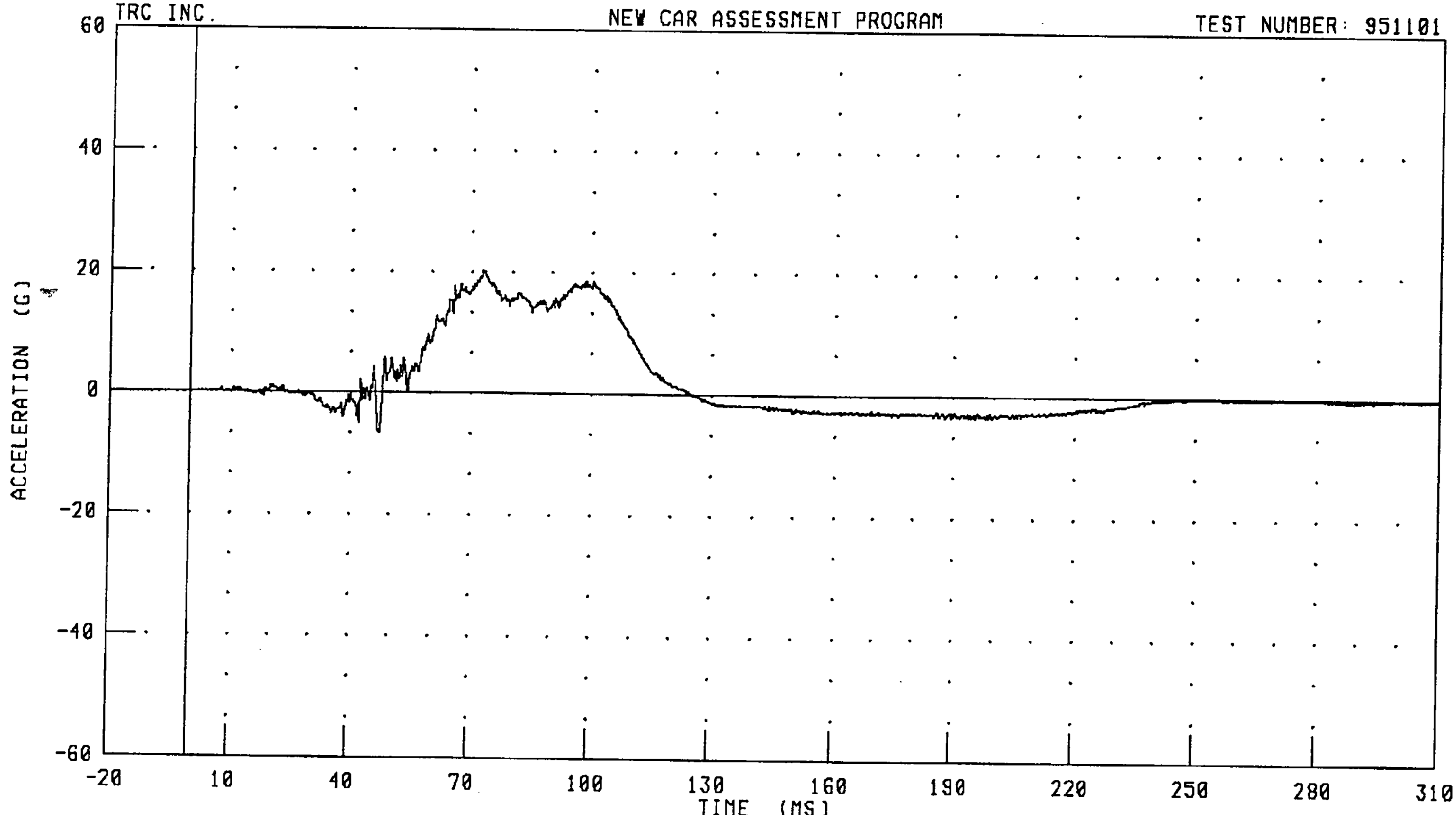


CHANNEL: PEVYG2 FILTER: CH. CLASS 1000

PEAK DATA: 11.84 G @ 48.48 MS; -5.93 G @ 46.00 MS

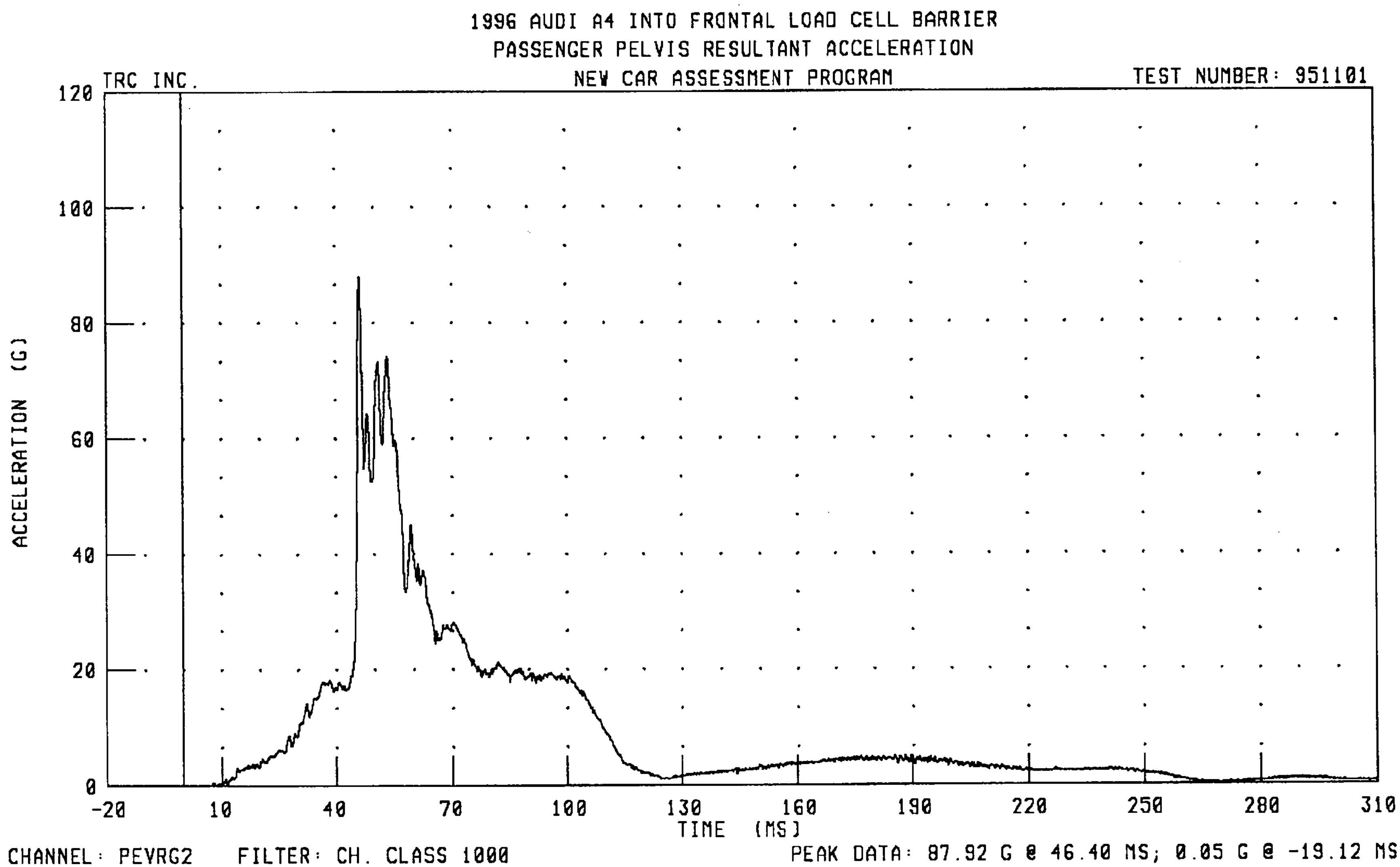
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER PELVIS Z-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 951101

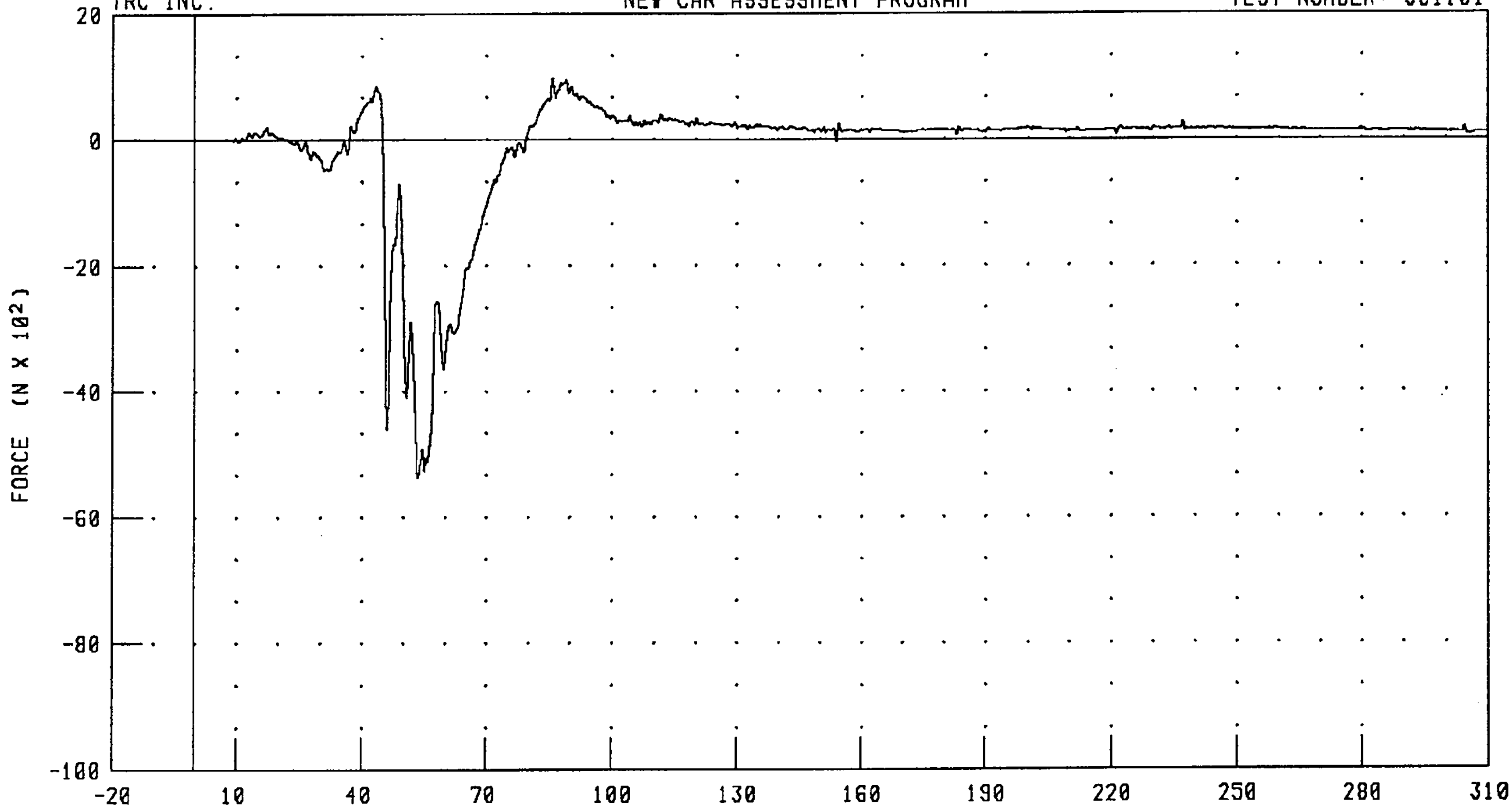


CHANNEL: PEVZG2 FILTER: CH. CLASS 1000

PEAK DATA: 20.33 G @ 72.88 MS; -6.64 G @ 47.44 MS


1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER PELVIS RESULTANT ACCELERATION
NEW CAR ASSESSMENT PROGRAM
TRC INC.
TEST NUMBER: 951101
ACCELERATION (G)
120
100
80
60
40
20
0
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: PEVRG2 FILTER: CH. CLASS 1000
PEAK DATA: 87.92 G @ 46.40 MS; 0.05 G @ -19.12 MS

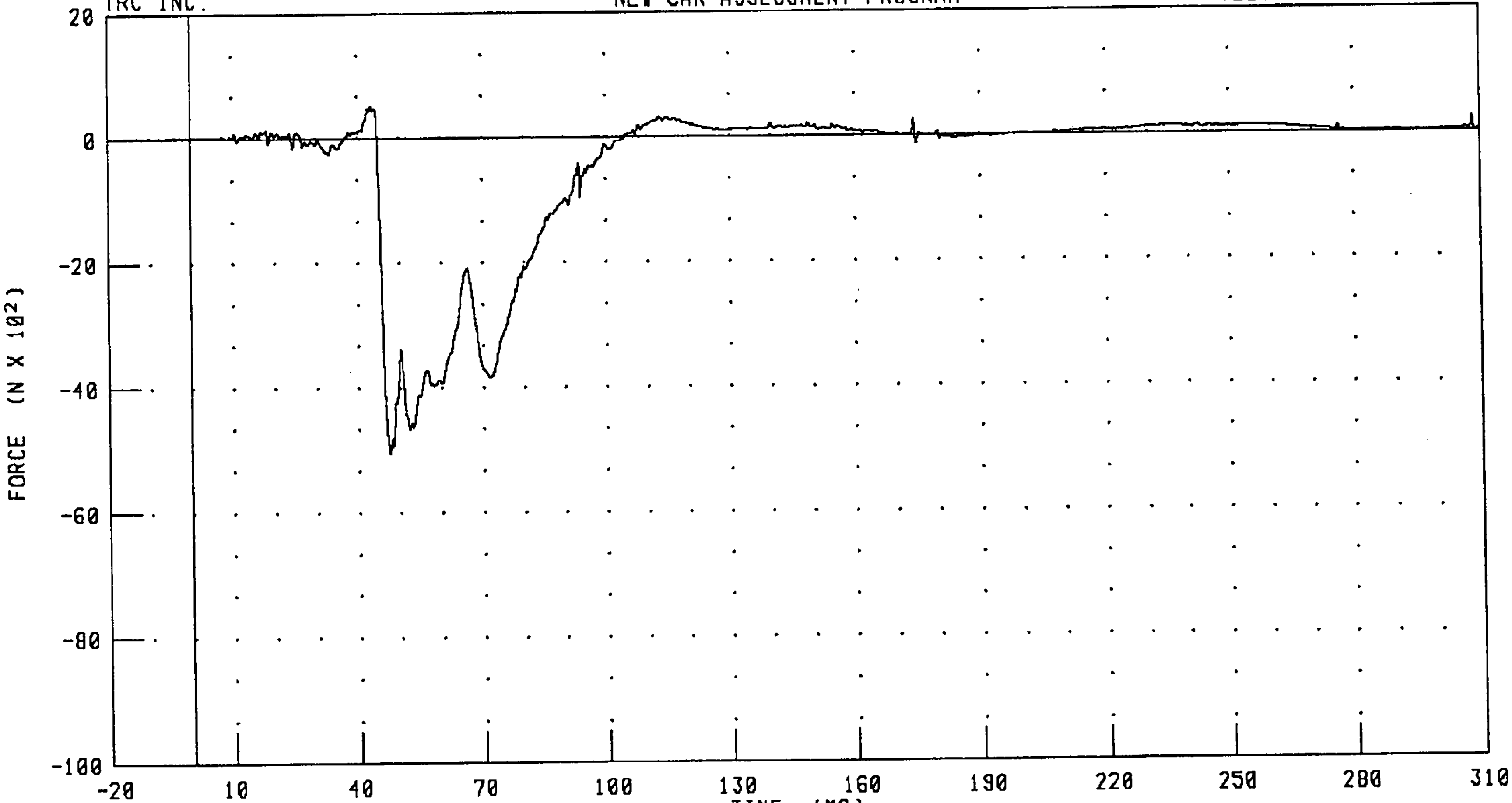
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER LEFT FEMUR FORCE
NEW CAR ASSESSMENT PROGRAM



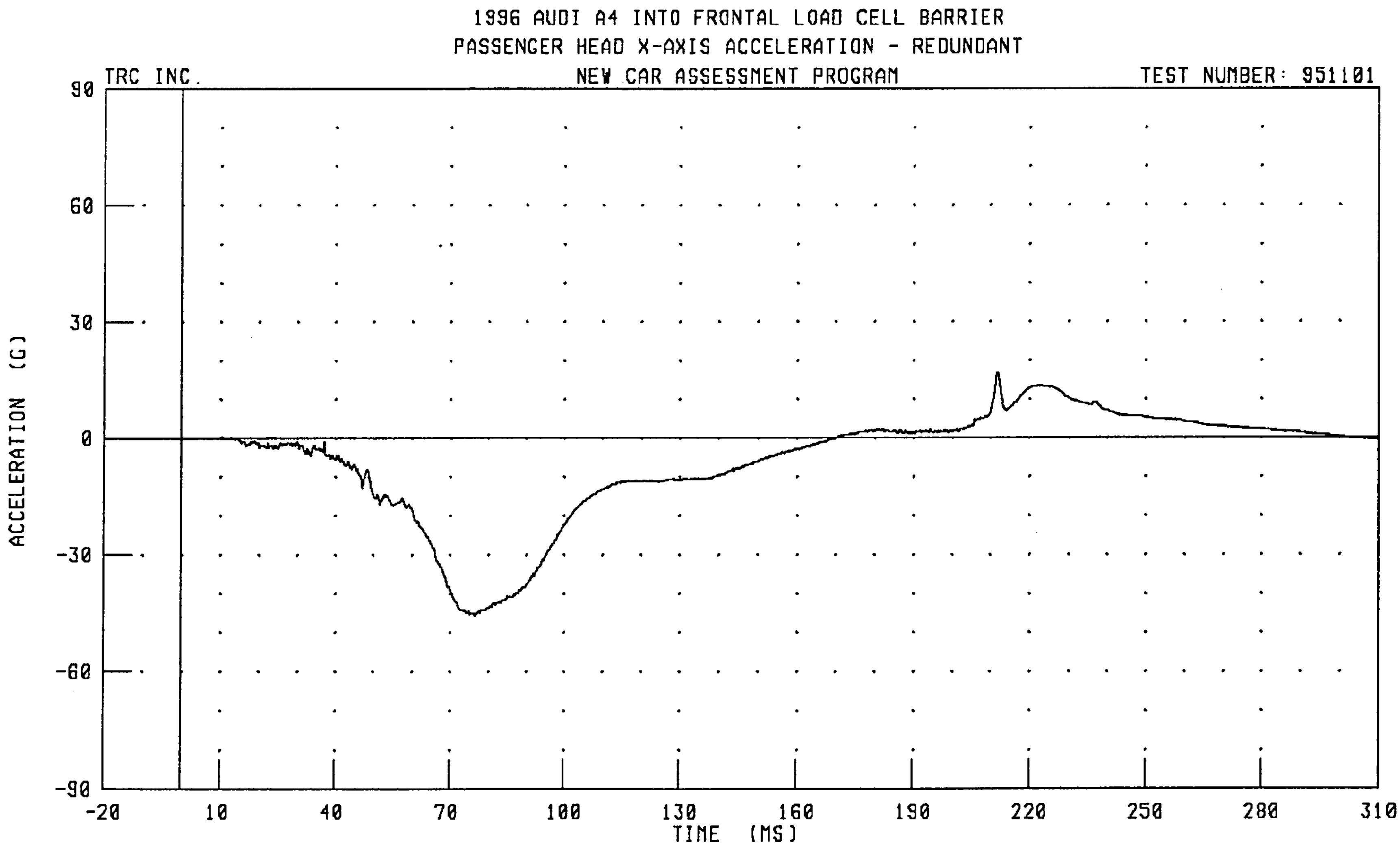
CHANNEL: LFMF2 FILTER: CH. CLASS 600 PEAK DATA: 962.48 N @ 85.84 MS; -5377.99 N @ 53.60 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER RIGHT FEMUR FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 951101



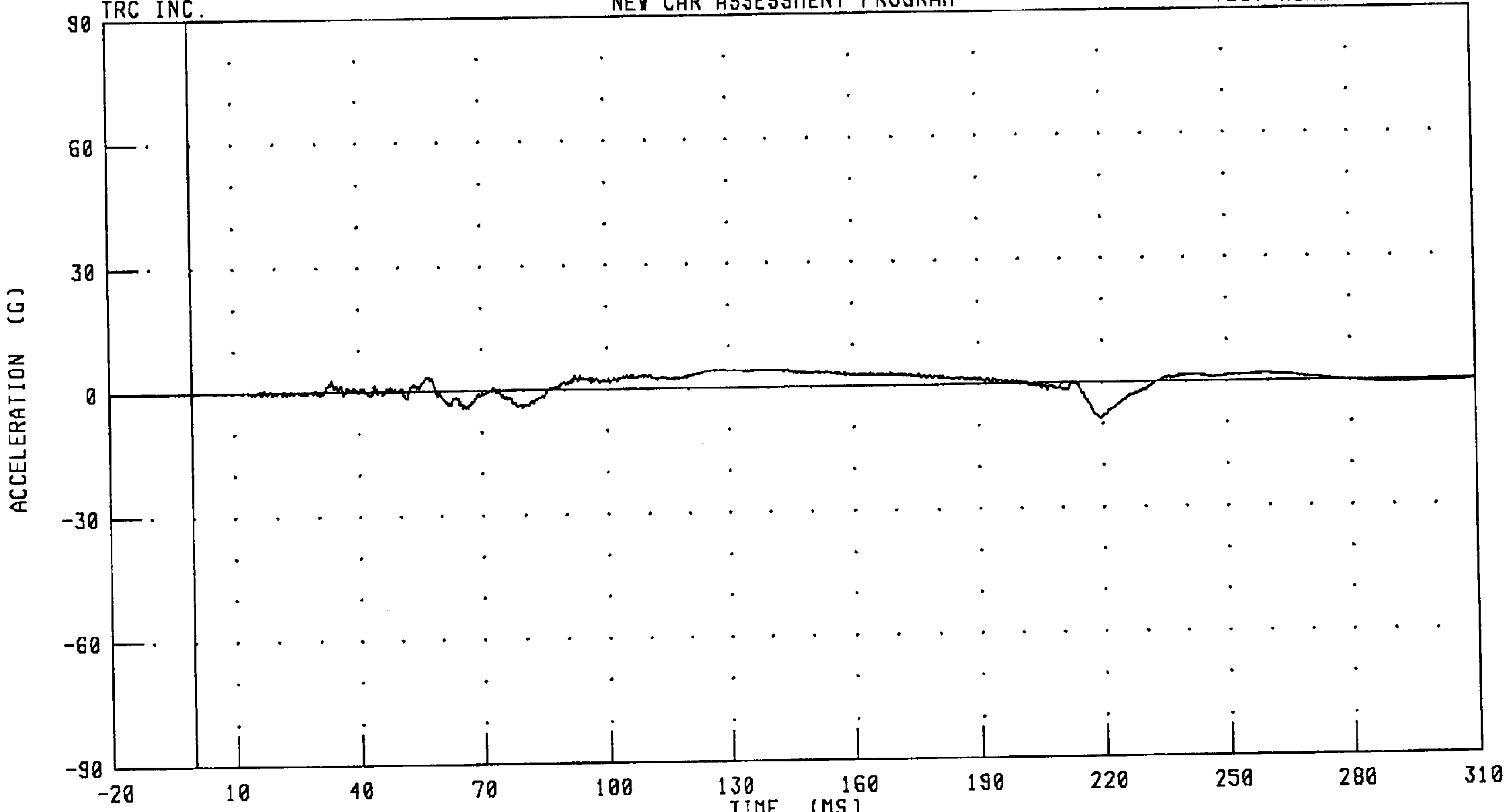
CHANNEL: RFMF2 FILTER: CH. CLASS 600 PEAK DATA: 497.55 N @ 43.44 MS; -5051.73 N @ 47.52 MS



CHANNEL: HEDXR2 FILTER: CH. CLASS 1000 PEAK DATA: 16.66 G @ 211.84 MS; -45.64 G @ 76.64 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD Y-AXIS ACCELERATION - REDUNDANT
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 951101

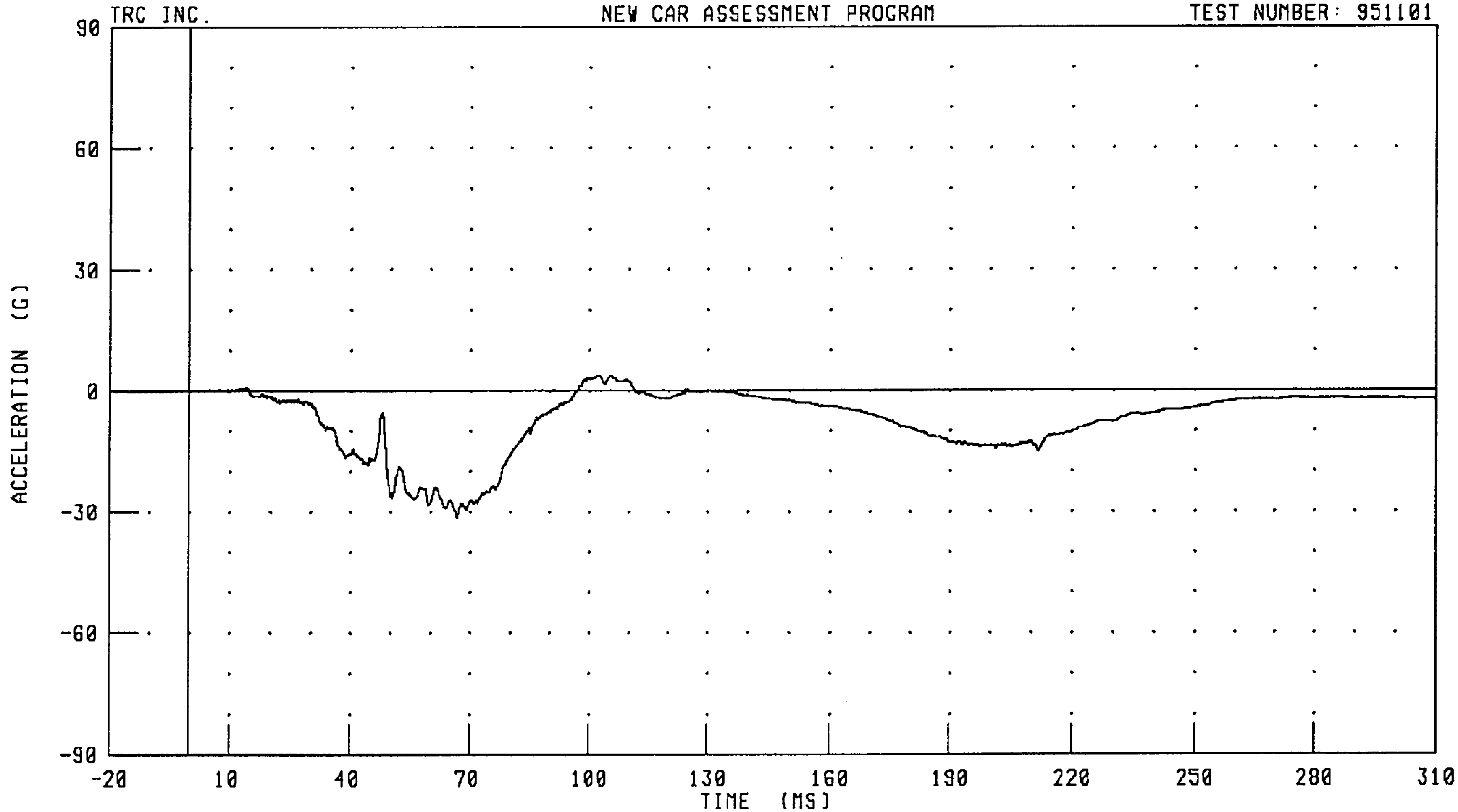


CHANNEL: HEDYR2 FILTER: CH. CLASS 1000

PEAK DATA: 4.40 G @ 126.32 MS; -8.88 G @ 219.60 MS

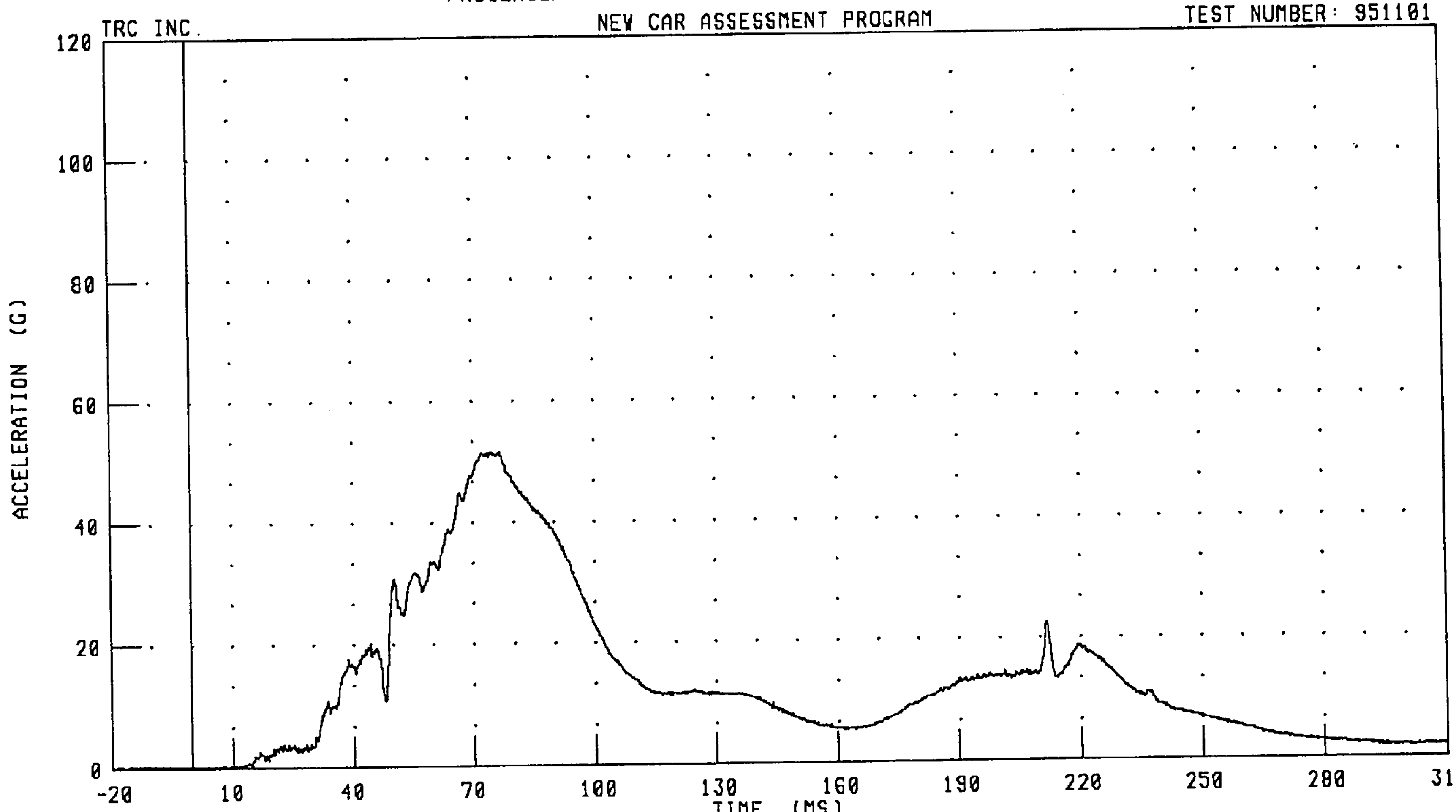
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD Z-AXIS ACCELERATION - REDUNDANT
NEW CAR ASSESSMENT PROGRAM

TRC INC. TEST NUMBER: 951101



CHANNEL: HEDZR2 FILTER: CH. CLASS 1000 PEAK DATA: 3.78 G @ 101.92 MS; -31.37 G @ 66.80 MS

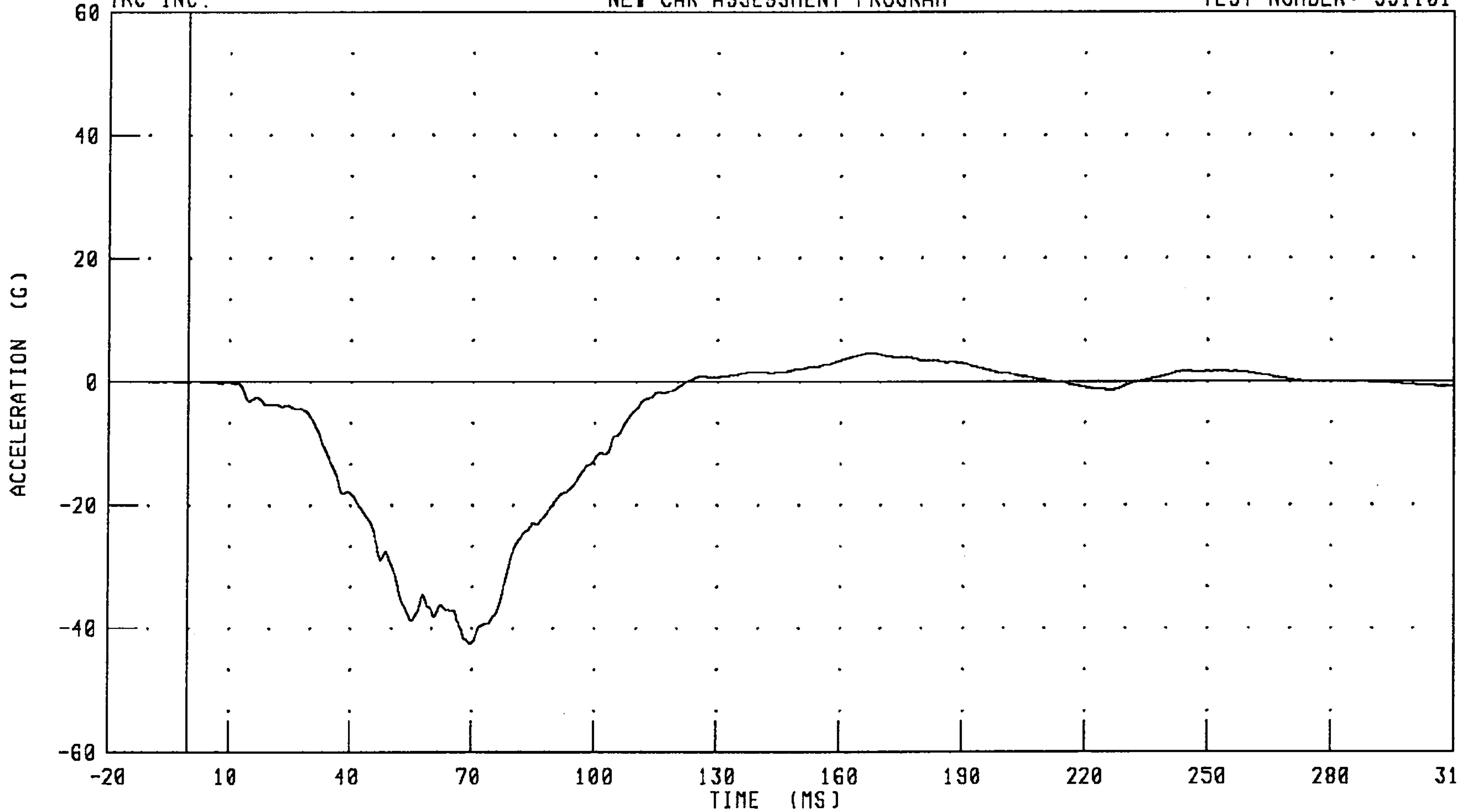
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD RESULTANT ACCELERATION - REDUNDANT
NEW CAR ASSESSMENT PROGRAM



CHANNEL: HEDRR2   FILTER: CH. CLASS 1000   PEAK DATA: 51.62 G @ 76.64 MS; 0.12 G @ -8.96 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST X-AXIS ACCELERATION - REDUNDANT
NEW CAR ASSESSMENT PROGRAM

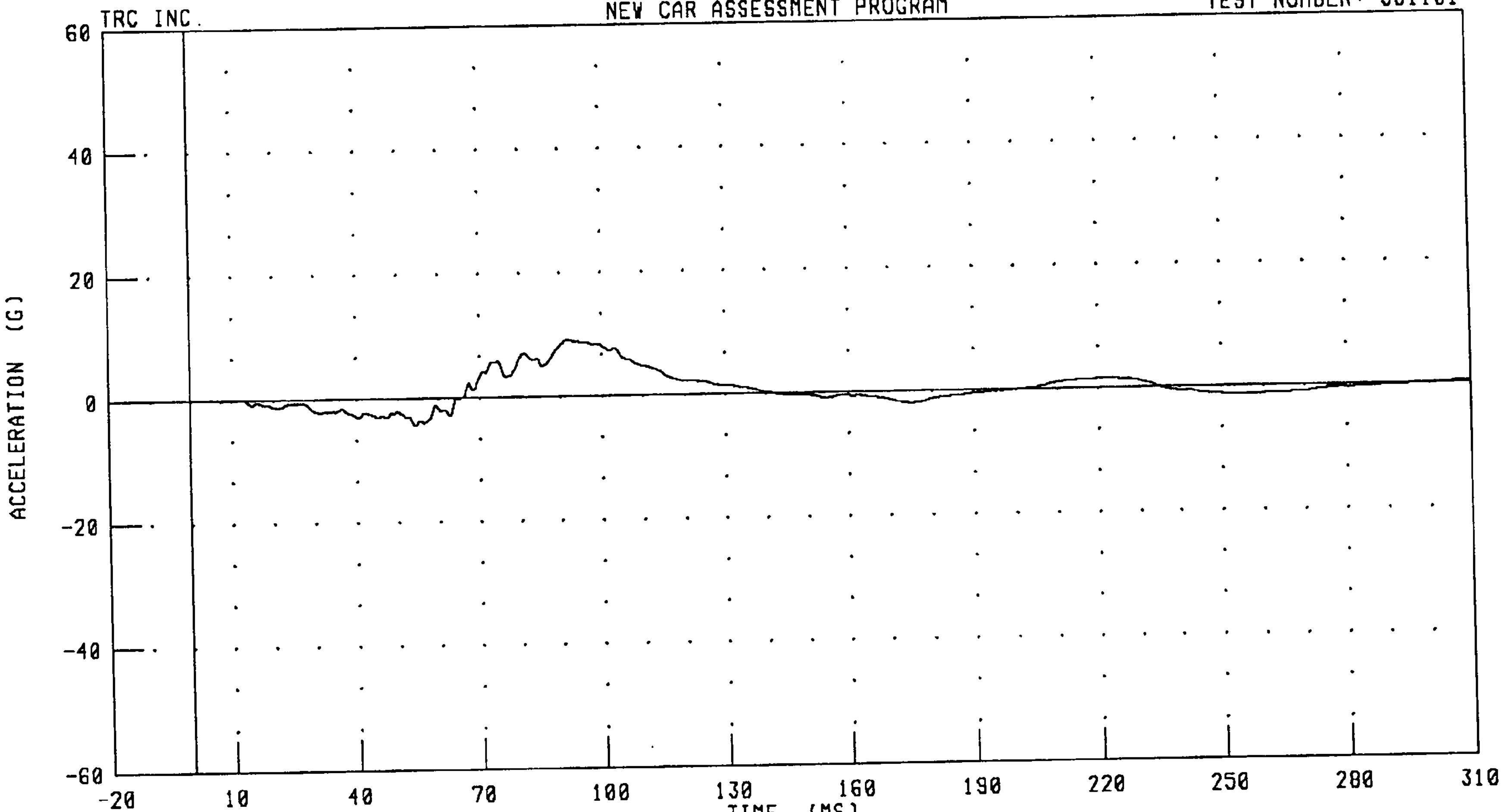
TRC INC. TEST NUMBER: 951101



CHANNEL: CSTXR2 FILTER: CH. CLASS 180 PEAK DATA: 4.63 G @ 167.84 MS; -42.49 G @ 69.84 MS

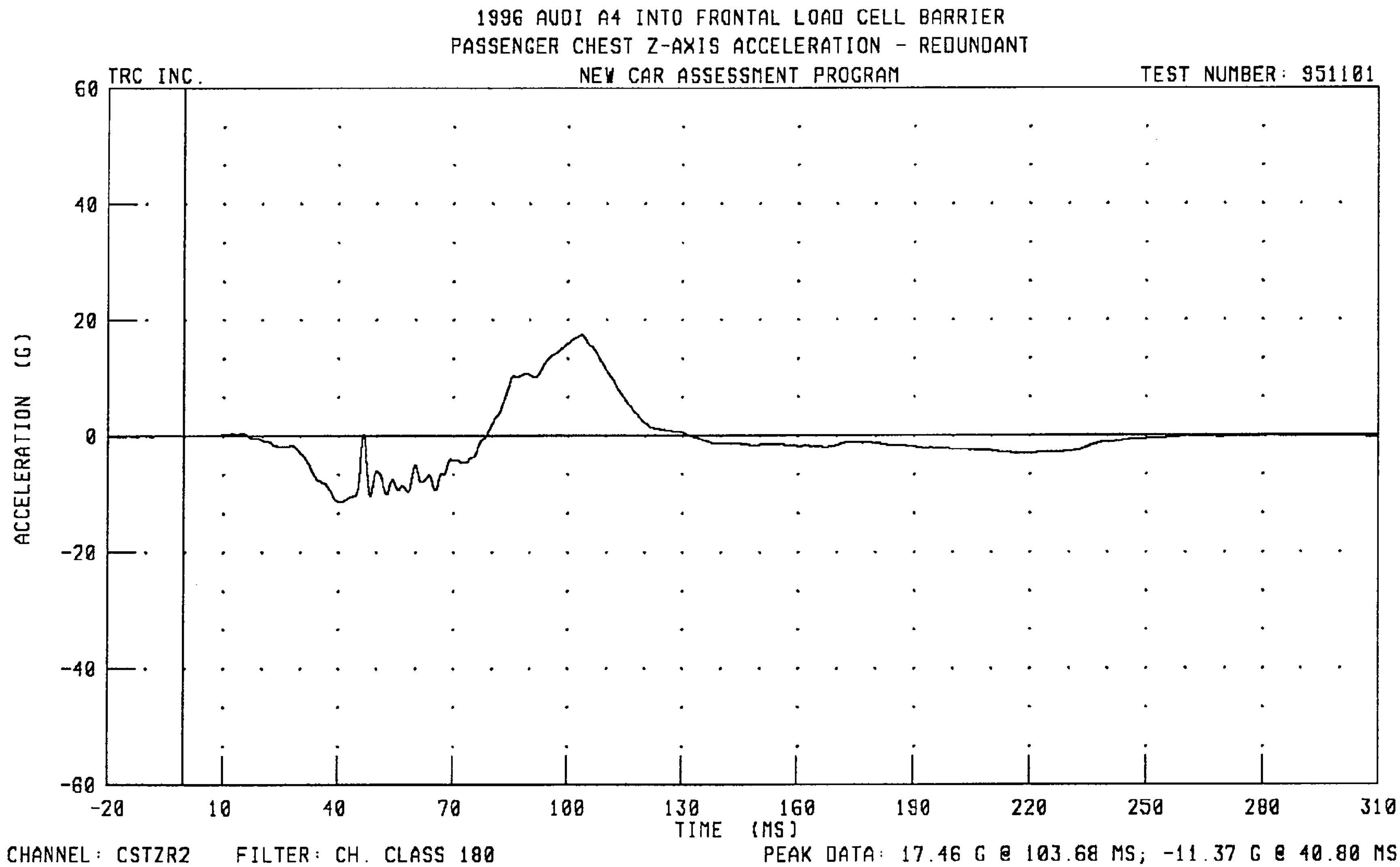
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST Y-AXIS ACCELERATION - REDUNDANT
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 951101

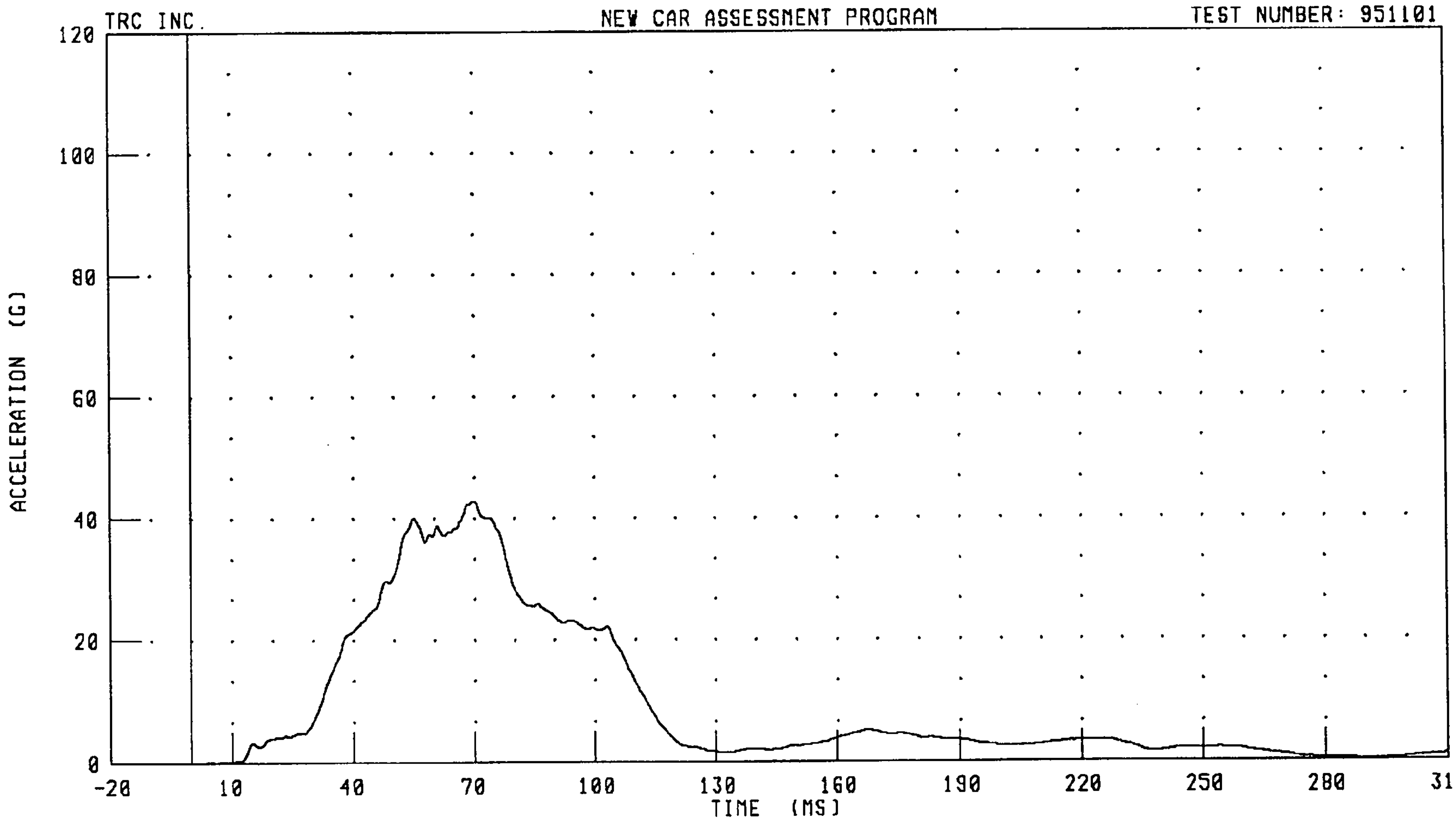


CHANNEL: CSTYR2   FILTER: CH. CLASS 180

PEAK DATA: 9.10 G @ 91.84 MS; -4.44 G @ 54.24 MS

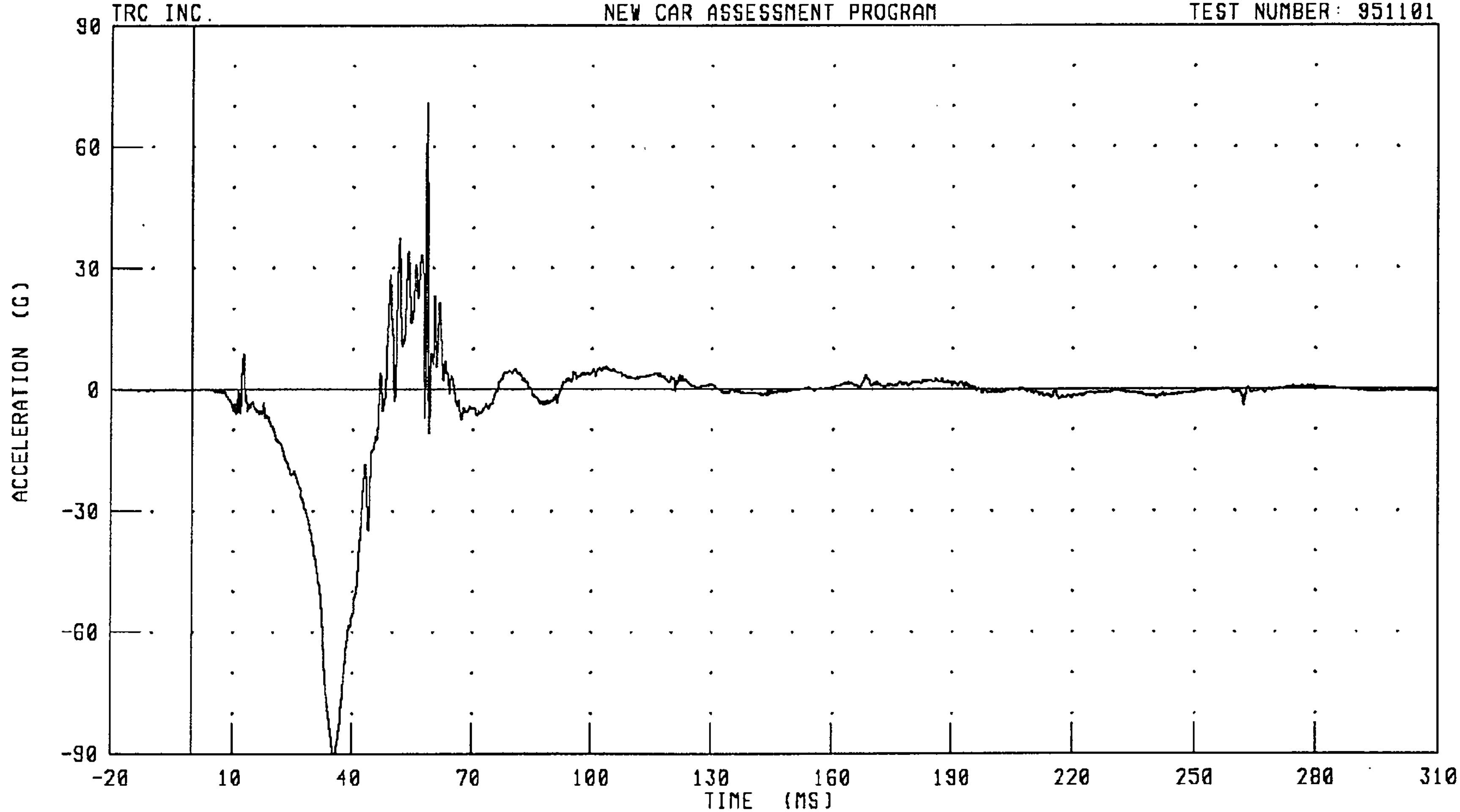

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST Z-AXIS ACCELERATION - REDUNDANT
NEW CAR ASSESSMENT PROGRAM
TRC INC.
TEST NUMBER: 951101
60
40
20
0
-20
-40
-60
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: CSTZR2
FILTER: CH. CLASS 180
PEAK DATA: 17.46 G @ 103.68 MS; -11.37 G @ 40.80 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST RESULTANT ACCELERATION - REDUNDANT
NEW CAR ASSESSMENT PROGRAM



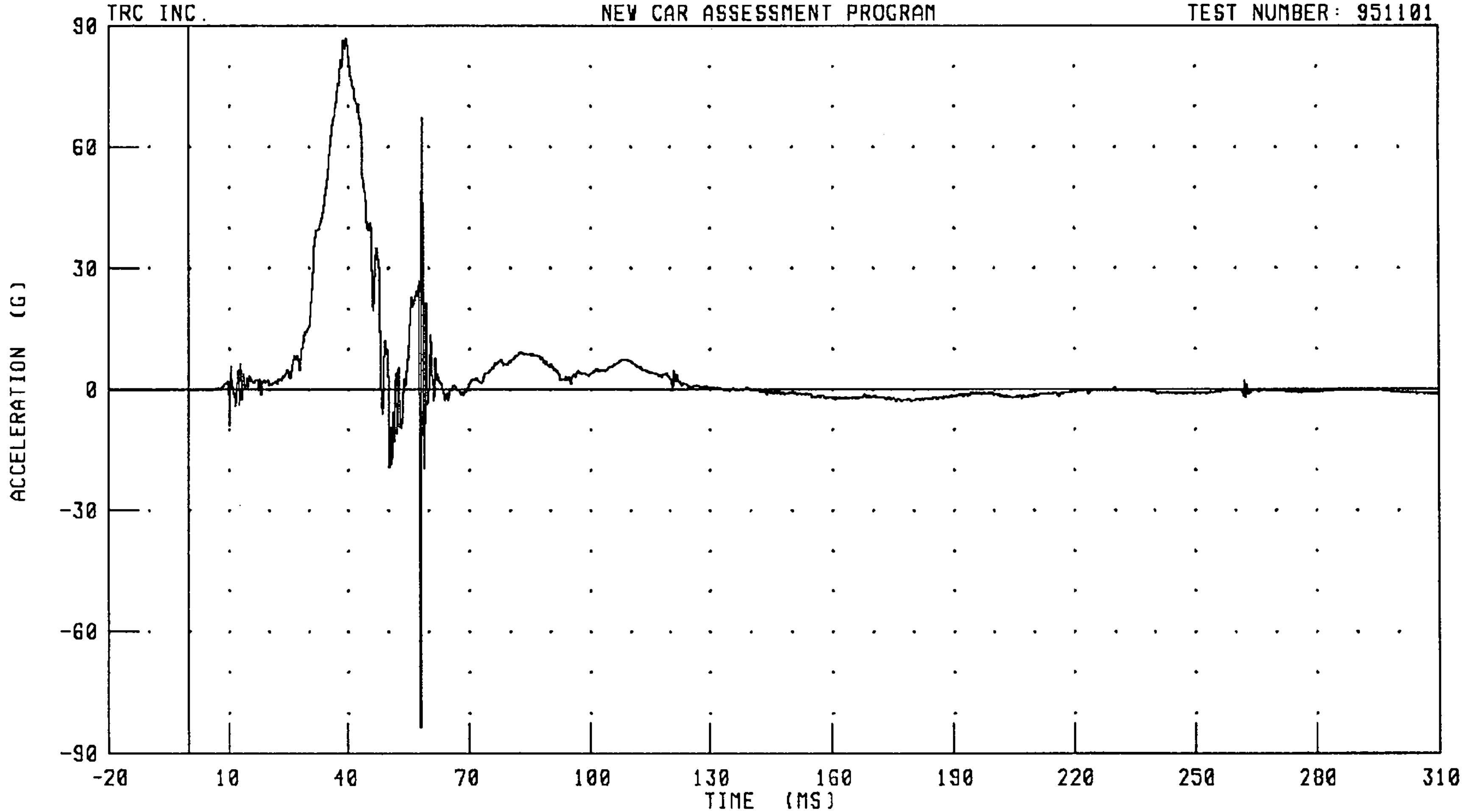
CHANNEL: CSTRR2 FILTER: CH. CLASS 180 PEAK DATA: 42.80 G @ 69.84 MS; 0.01 G @ -20.00 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER LEFT FOOT X-AXIS ACCELERATION
TRC INC. NEW CAR ASSESSMENT PROGRAM TEST NUMBER: 951101

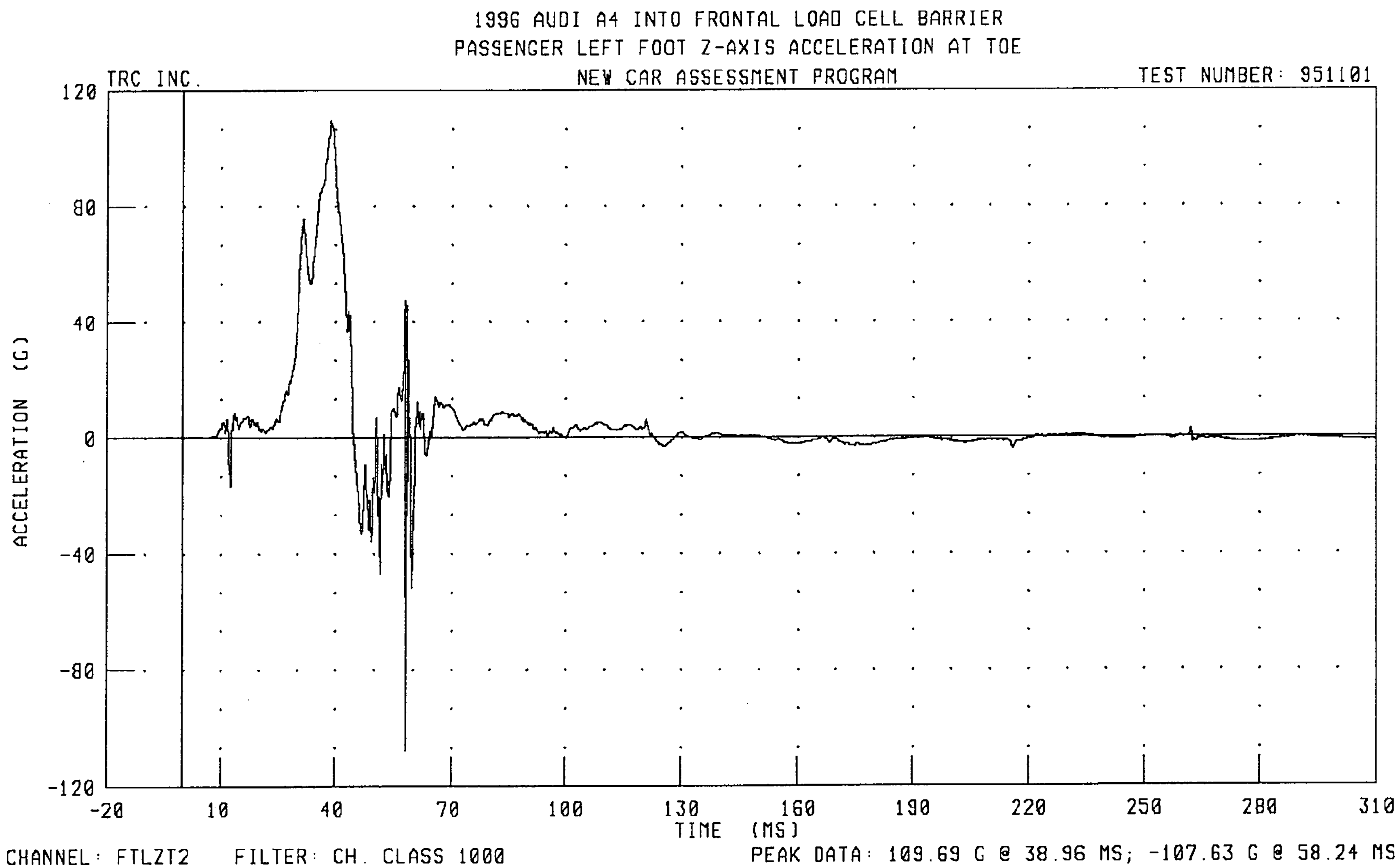


CHANNEL: FTLXG2 FILTER: CH. CLASS 1000 PEAK DATA: 70.90 G @ 58.48 MS; -92.15 G @ 35.44 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER LEFT FOOT Z-AXIS ACCELERATION AT HEEL
NEW CAR ASSESSMENT PROGRAM



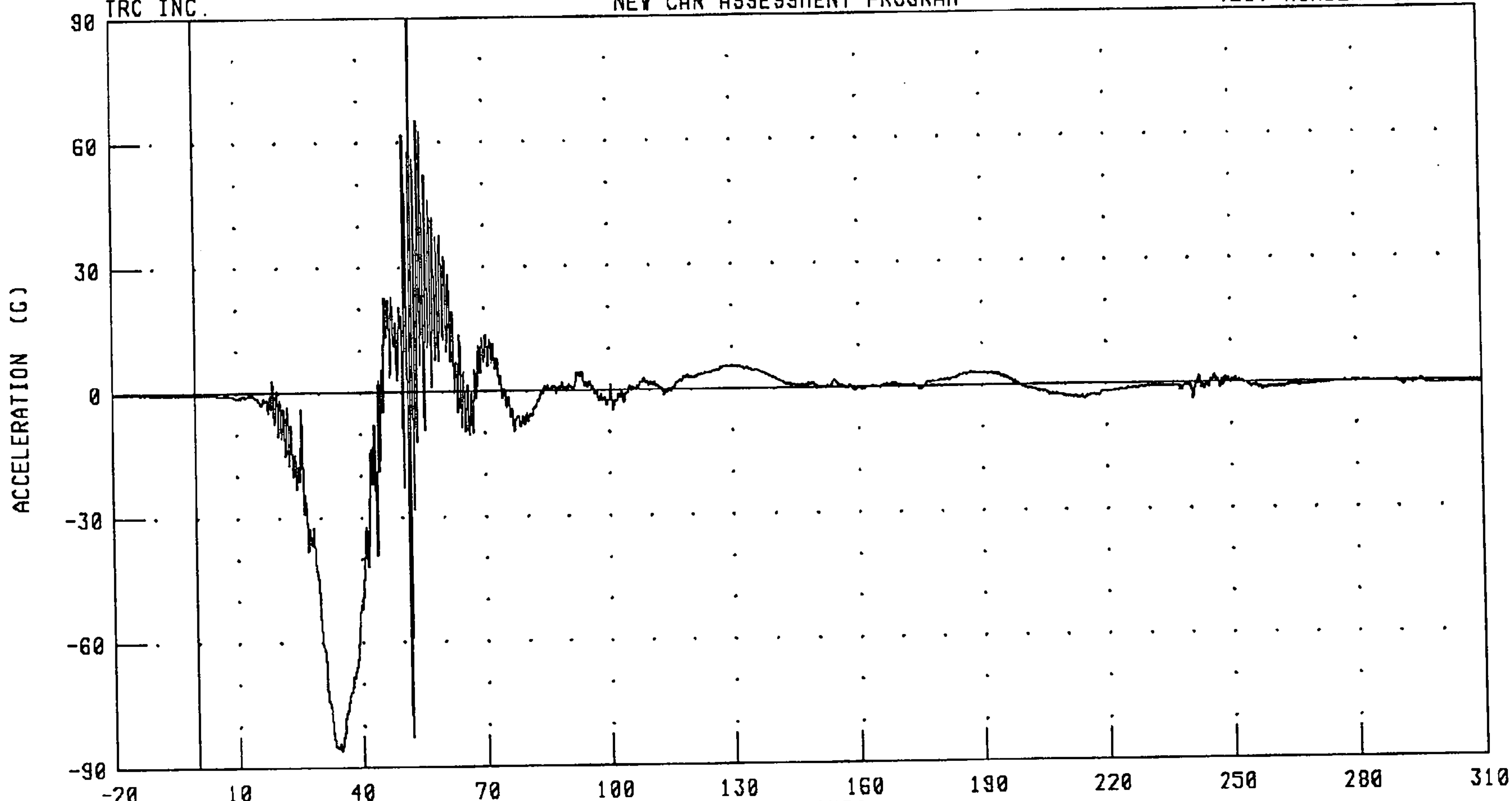
CHANNEL: FTLZH2 FILTER: CH. CLASS 1000 PEAK DATA: 87.00 G @ 39.52 MS; -83.60 G @ 58.16 MS



1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER LEFT FOOT Z-AXIS ACCELERATION AT TOE
NEW CAR ASSESSMENT PROGRAM
TRC INC.
TEST NUMBER: 951101
ACCELERATION (G)
120
80
40
0
-40
-80
-120
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: FTLZT2 FILTER: CH. CLASS 1000
PEAK DATA: 109.69 G @ 38.96 MS; -107.63 G @ 58.24 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER RIGHT FOOT X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 951101

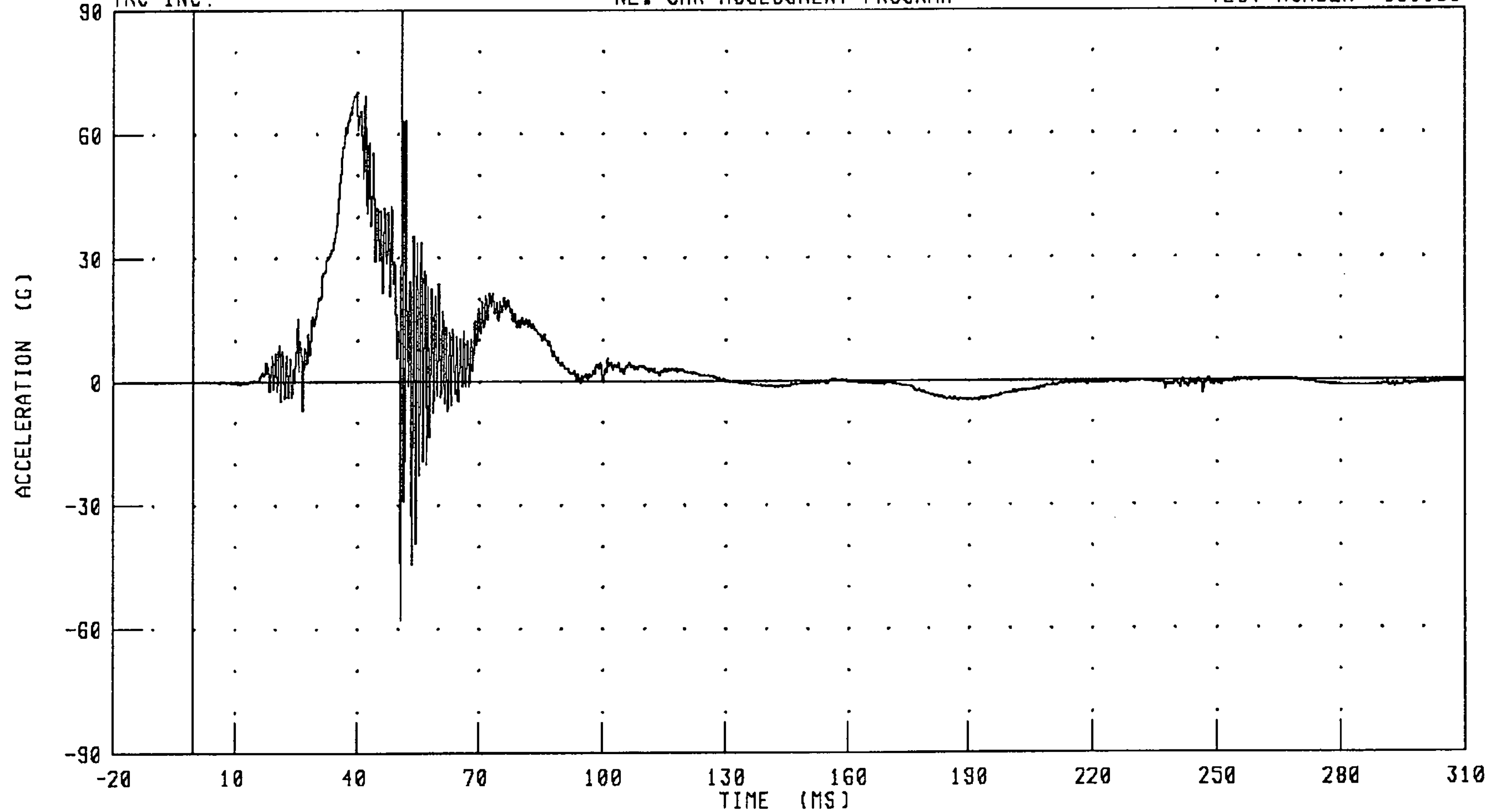


CHANNEL: FTRXG2   FILTER: CH. CLASS 1000

PEAK DATA: 98.65 G @ 52.48 MS; -85.99 G @ 34.64 MS

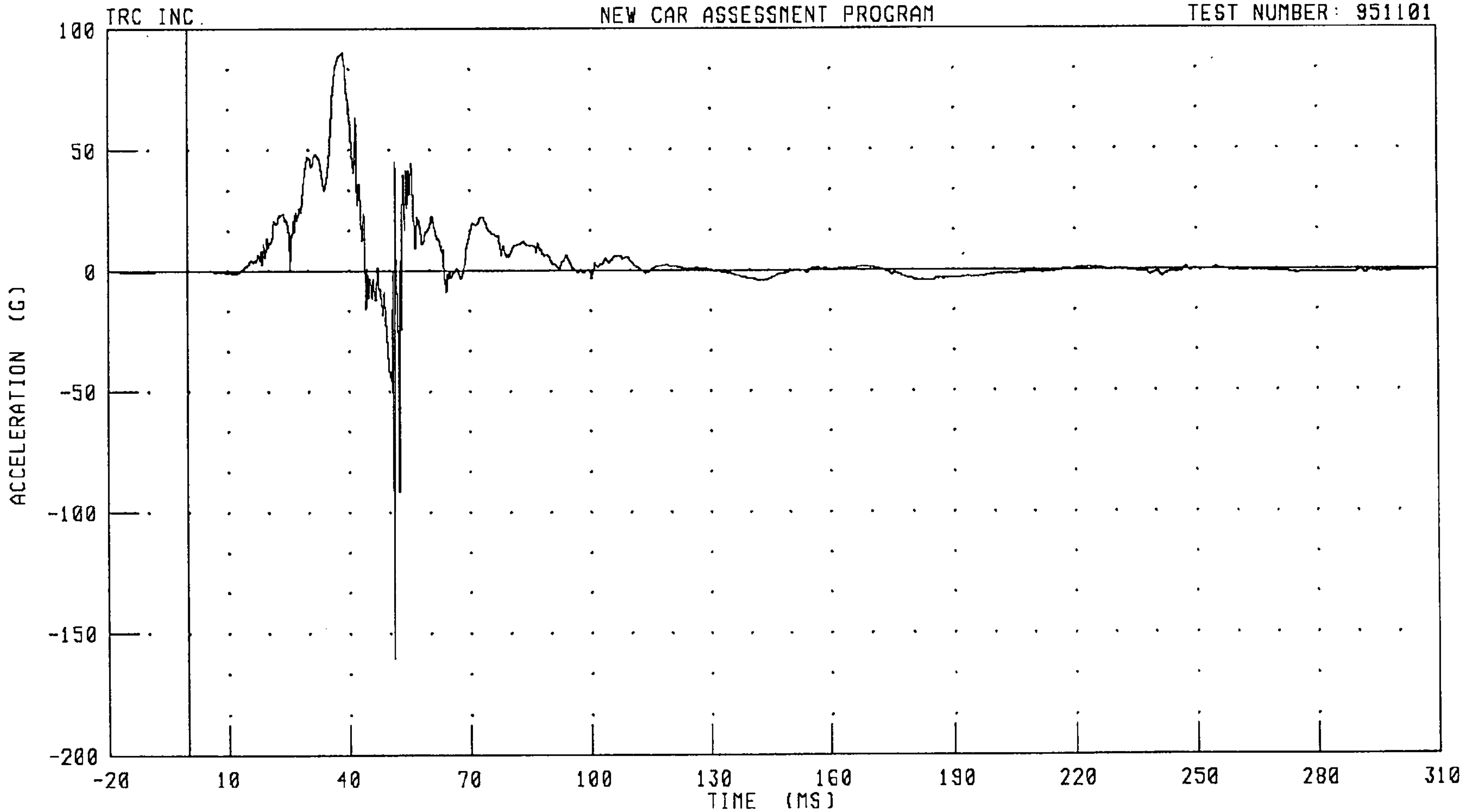
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER RIGHT FOOT Z-AXIS ACCELERATION AT HEEL
NEW CAR ASSESSMENT PROGRAM

TRC INC. TEST NUMBER: 951101



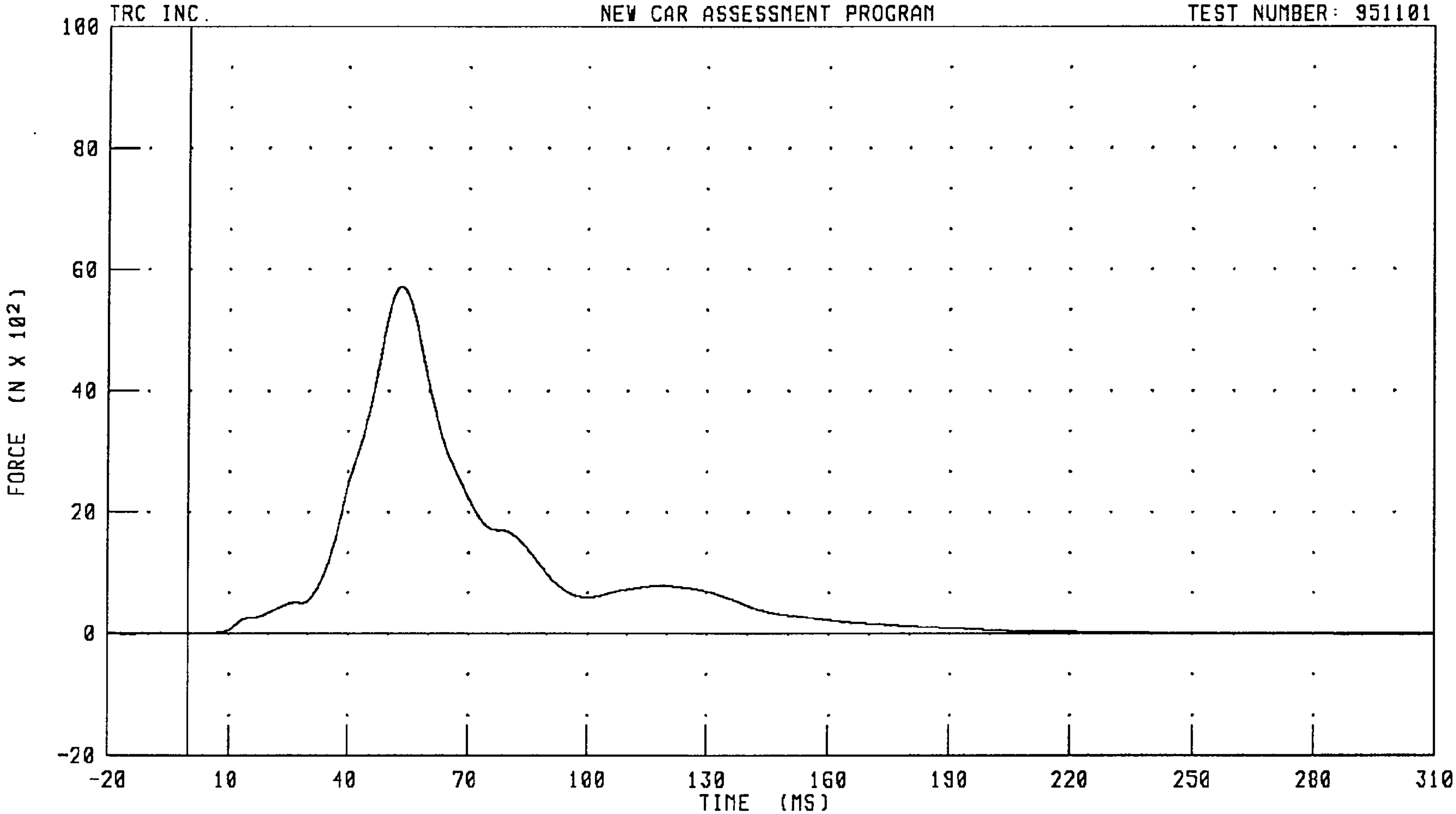
CHANNEL: FTRZH2 FILTER: CH. CLASS 1000 PEAK DATA: 99.38 G @ 50.96 MS; -58.02 G @ 50.64 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER RIGHT FOOT Z-AXIS ACCELERATION AT TOE
NEW CAR ASSESSMENT PROGRAM



CHANNEL: FTRZT2 FILTER: CH. CLASS 1000 PEAK DATA: 90.26 G @ 38.64 MS; -160.63 G @ 51.20 MS

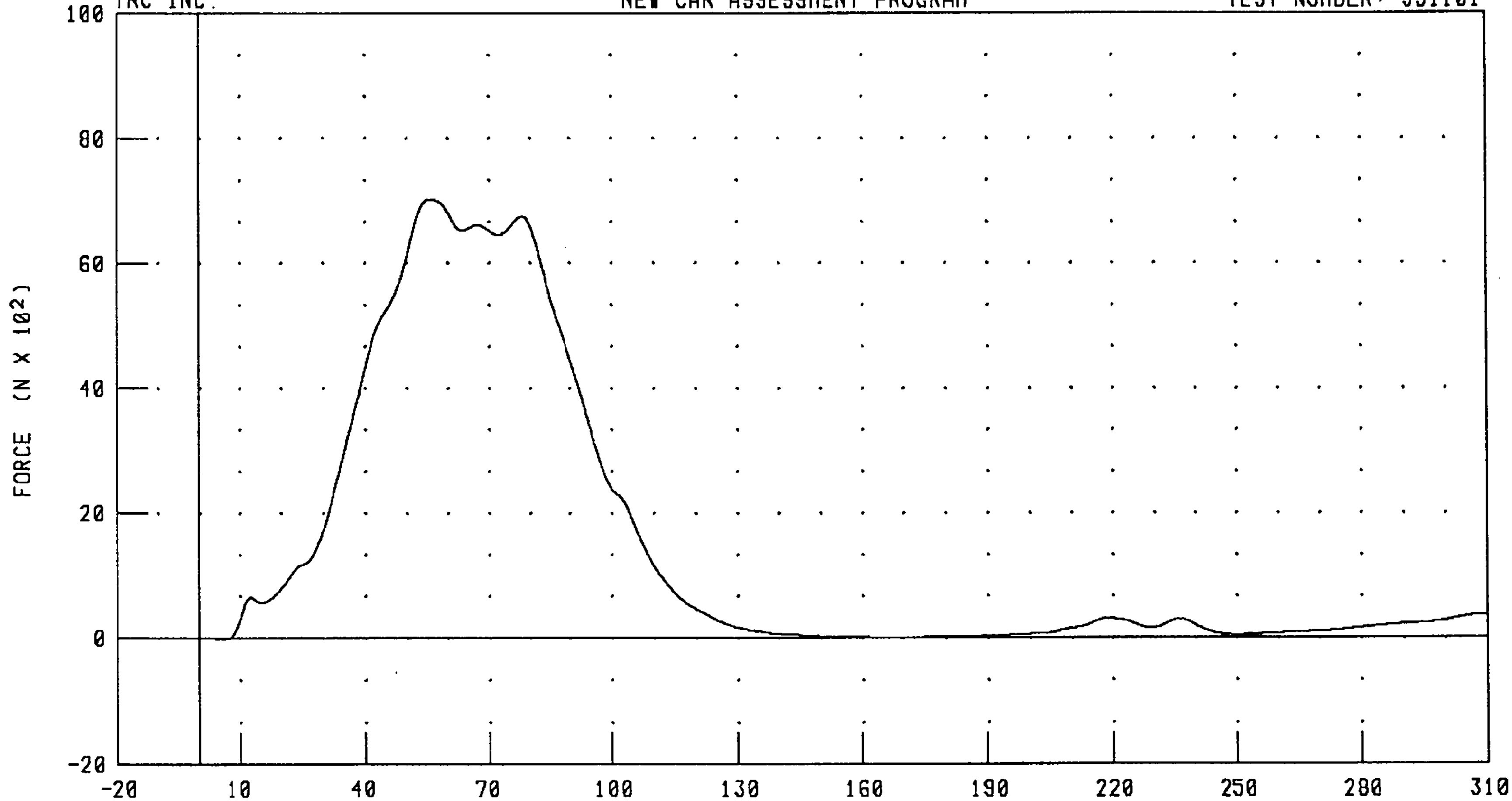
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER LAP BELT OUTBOARD FORCE
NEW CAR ASSESSMENT PROGRAM



CHANNEL: LBOF1 FILTER: CH. CLASS 60 PEAK DATA: 5715.55 N @ 53.28 MS; -10.14 N @ 298.16 MS

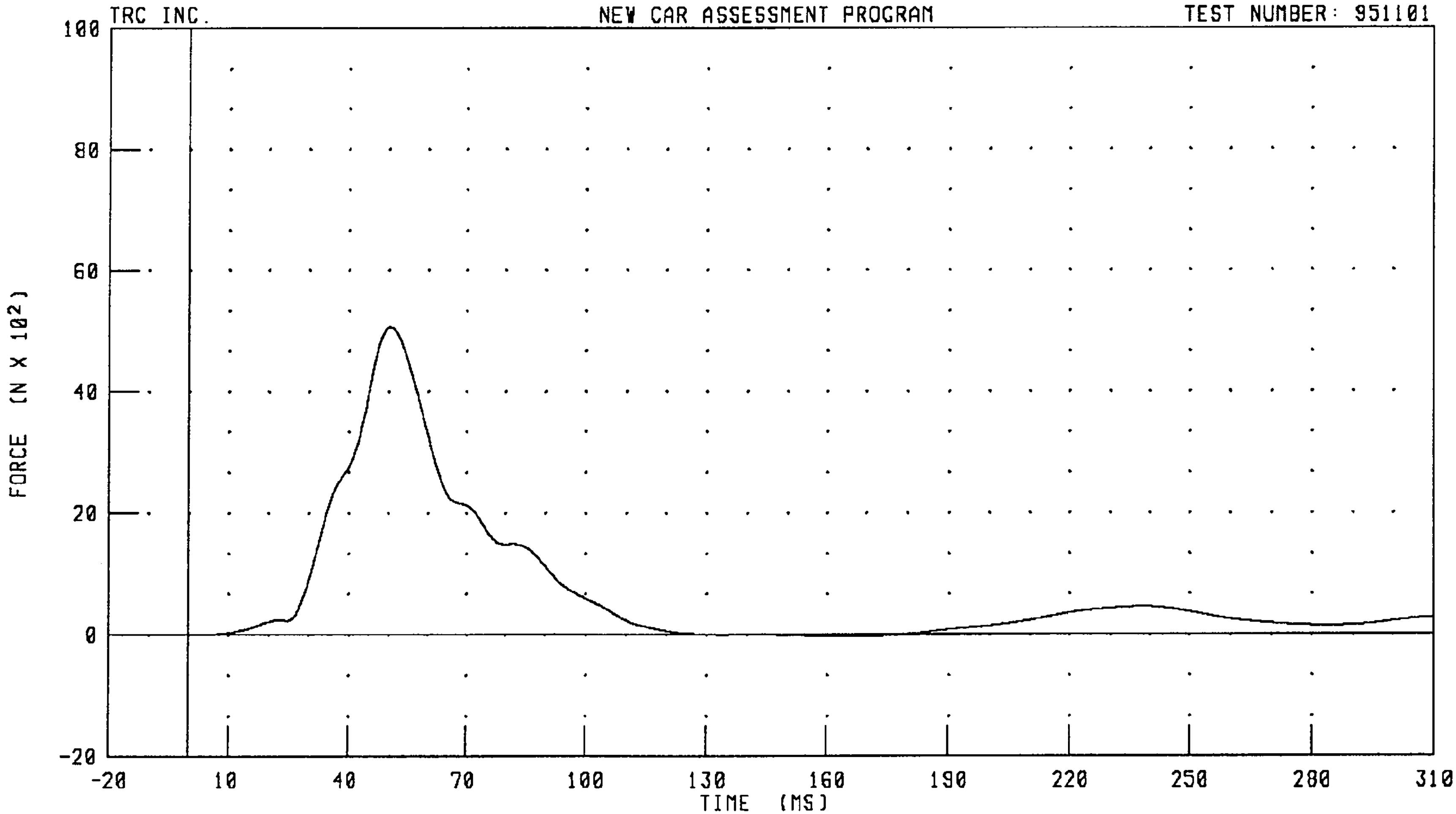
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
DRIVER SHOULDER BELT FORCE
NEW CAR ASSESSMENT PROGRAM

TRC INC. TEST NUMBER: 951101



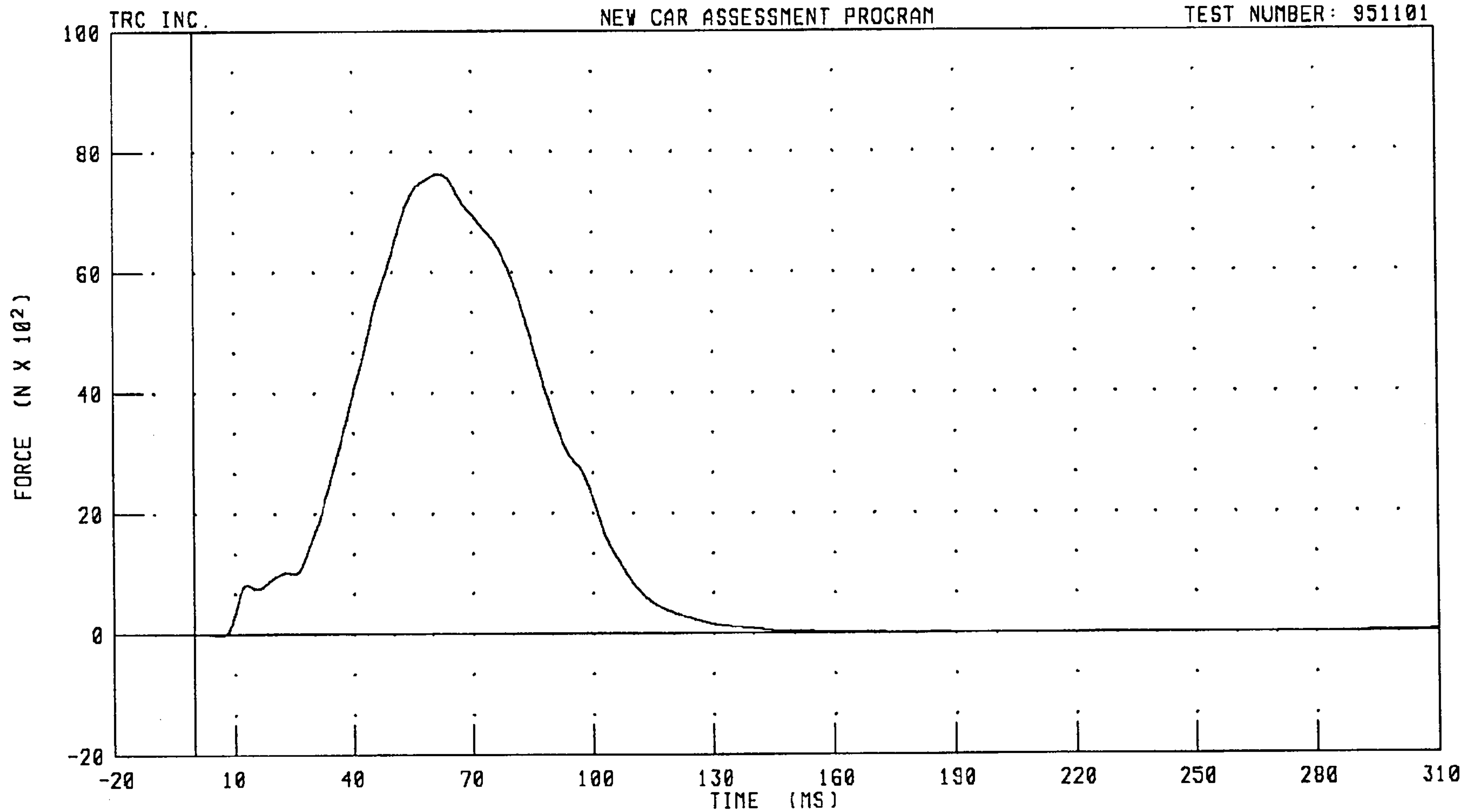
CHANNEL: SHBF1 FILTER: CH. CLASS 60 PEAK DATA: 7019.68 N @ 55.60 MS; -19.23 N @ 6.16 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER LAP BELT OUTBOARD FORCE
NEW CAR ASSESSMENT PROGRAM



CHANNEL: LBOF2 FILTER: CH. CLASS 60 PEAK DATA: 5060.71 N @ 50.40 MS; -36.87 N @ 166.00 MS

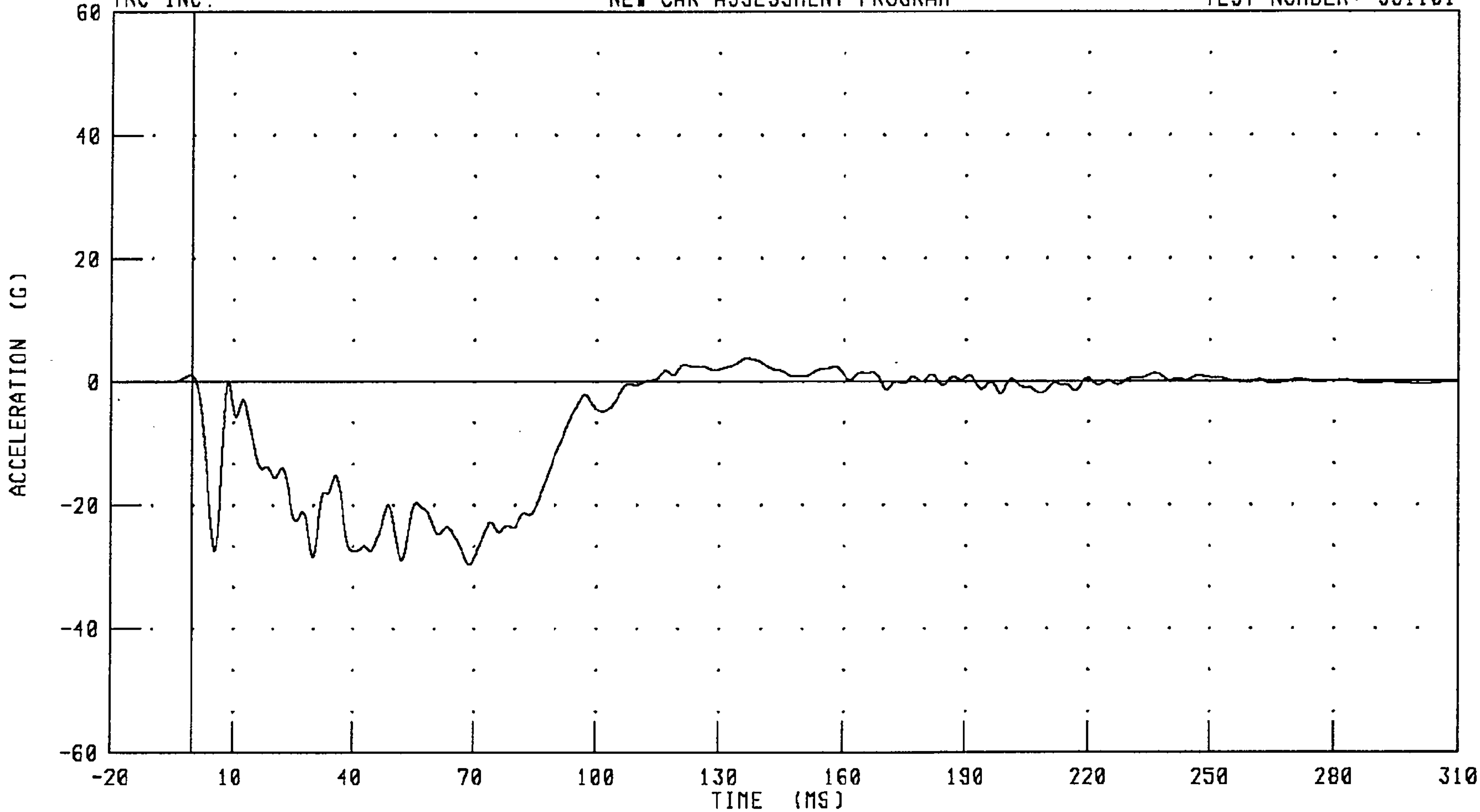
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER SHOULDER BELT FORCE
NEW CAR ASSESSMENT PROGRAM



CHANNEL: SHBF2 FILTER: CH. CLASS 60 PEAK DATA: 7629.08 N @ 61.92 MS; -28.14 N @ 6.40 MS

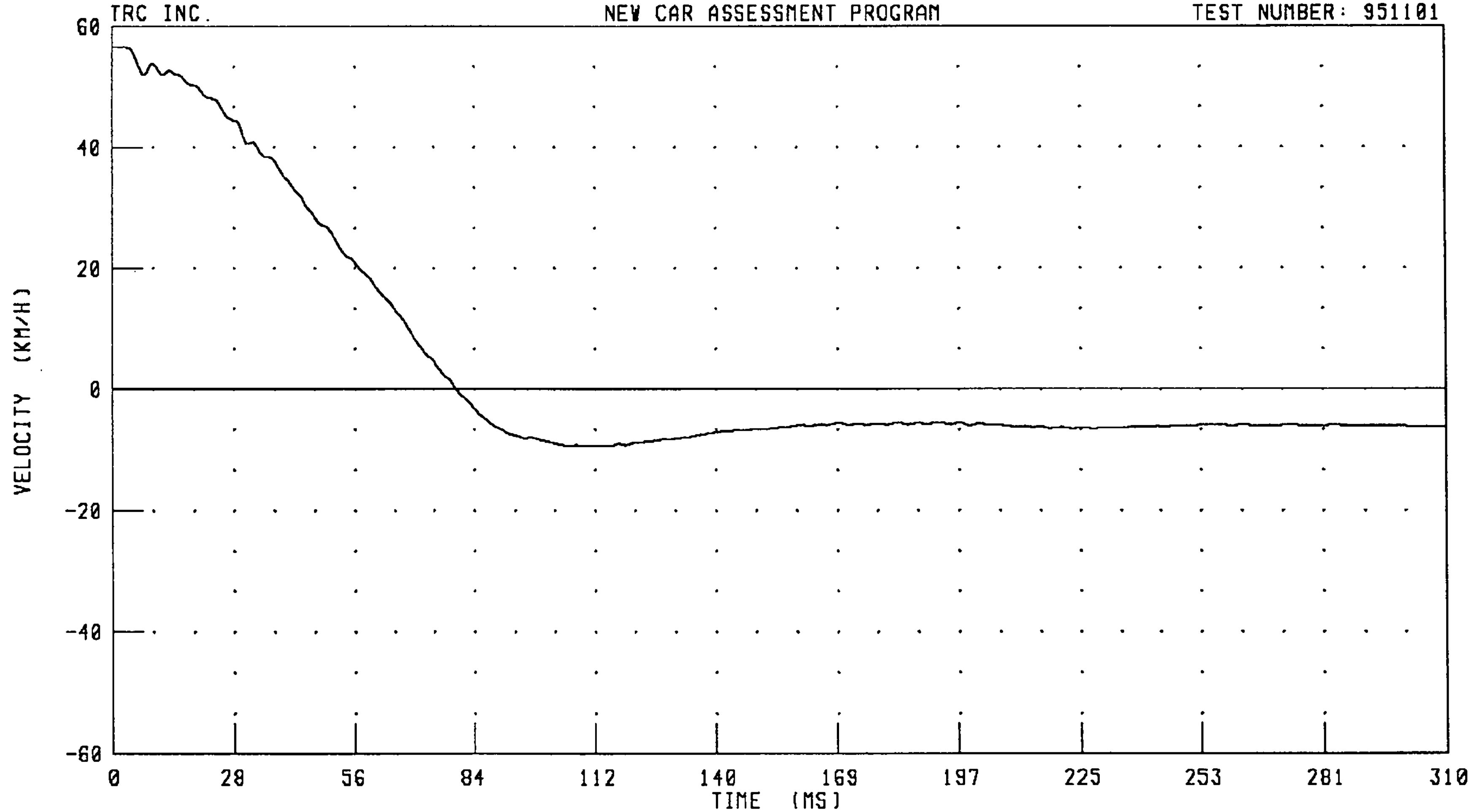
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TRC INC. TEST NUMBER: 951101



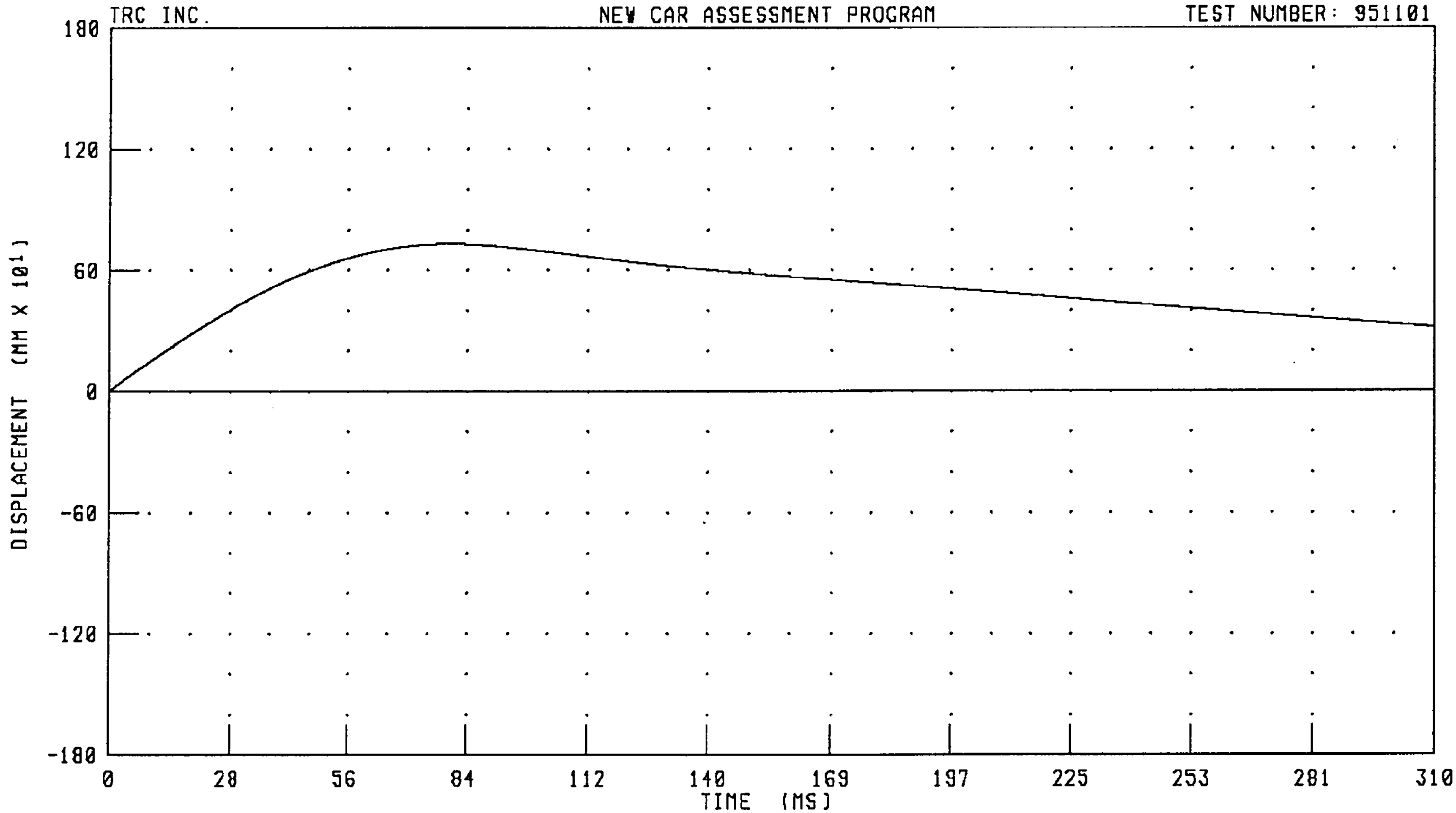
CHANNEL: TLRXG1 FILTER: CH. CLASS 60 PEAK DATA: 3.73 G @ 136.72 MS; -29.60 G @ 68.96 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT X-AXIS VELOCITY
NEW CAR ASSESSMENT PROGRAM



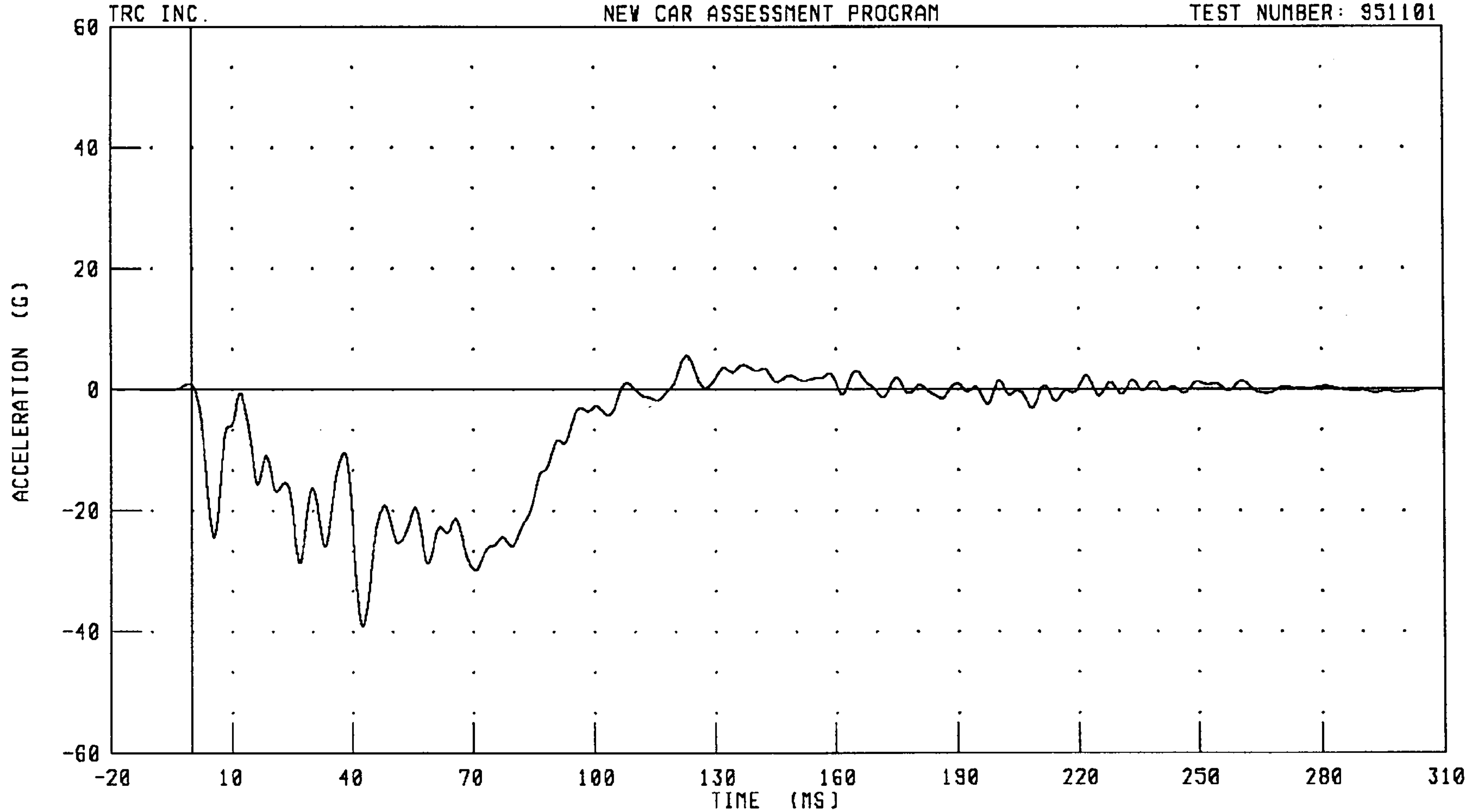
CHANNEL: TLRXV1 FILTER: CH. CLASS 180 PEAK DATA: 56.50 KM/H @ 2.88 MS; -9.38 KM/H @ 116.16 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT X-AXIS DISPLACEMENT

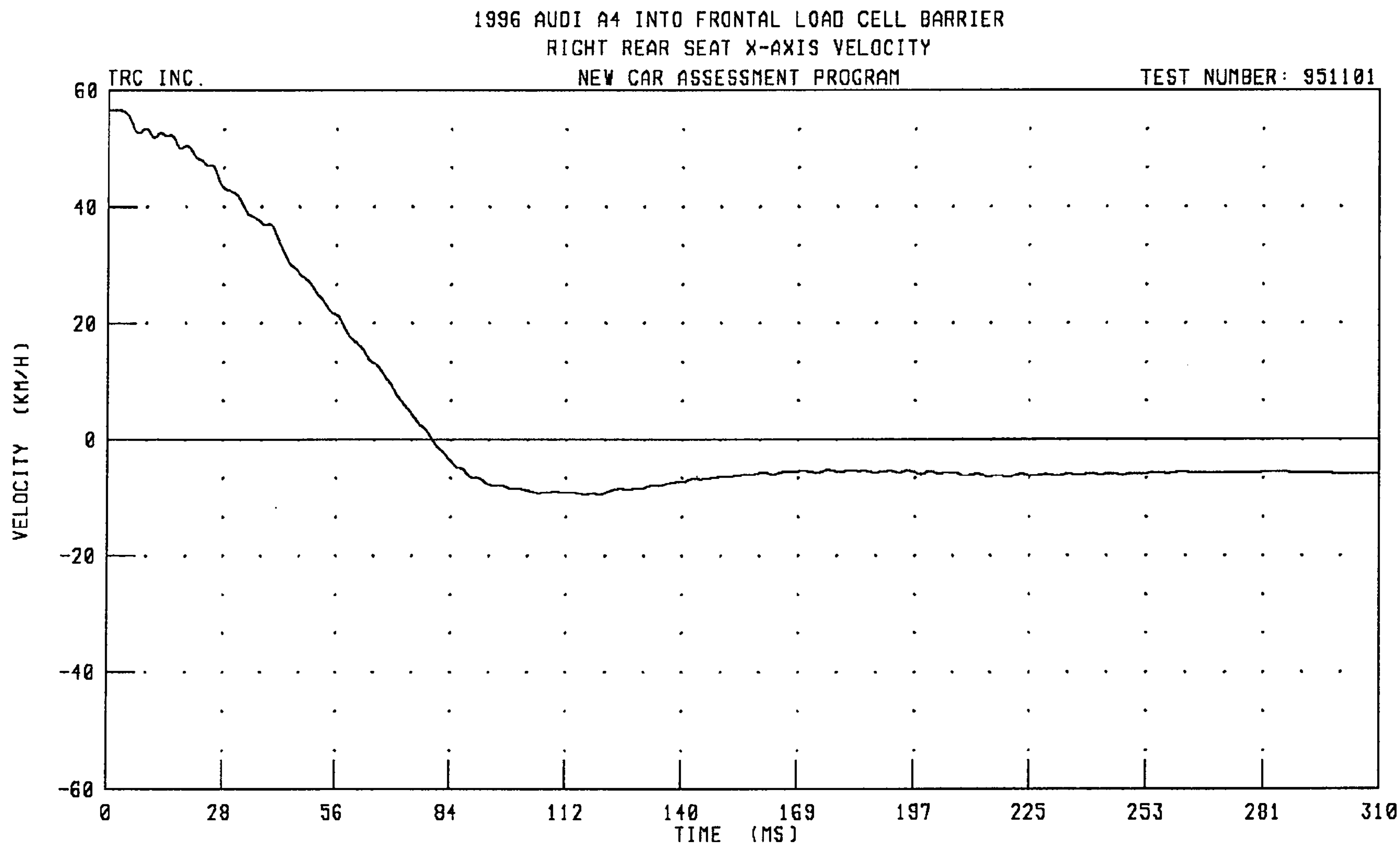


CHANNEL: TLRXD1 FILTER: CH. CLASS 180 PEAK DATA: 730.49 MM @ 80.40 MS; 0.00 MM @ 0.00 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
RIGHT REAR SEAT X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM



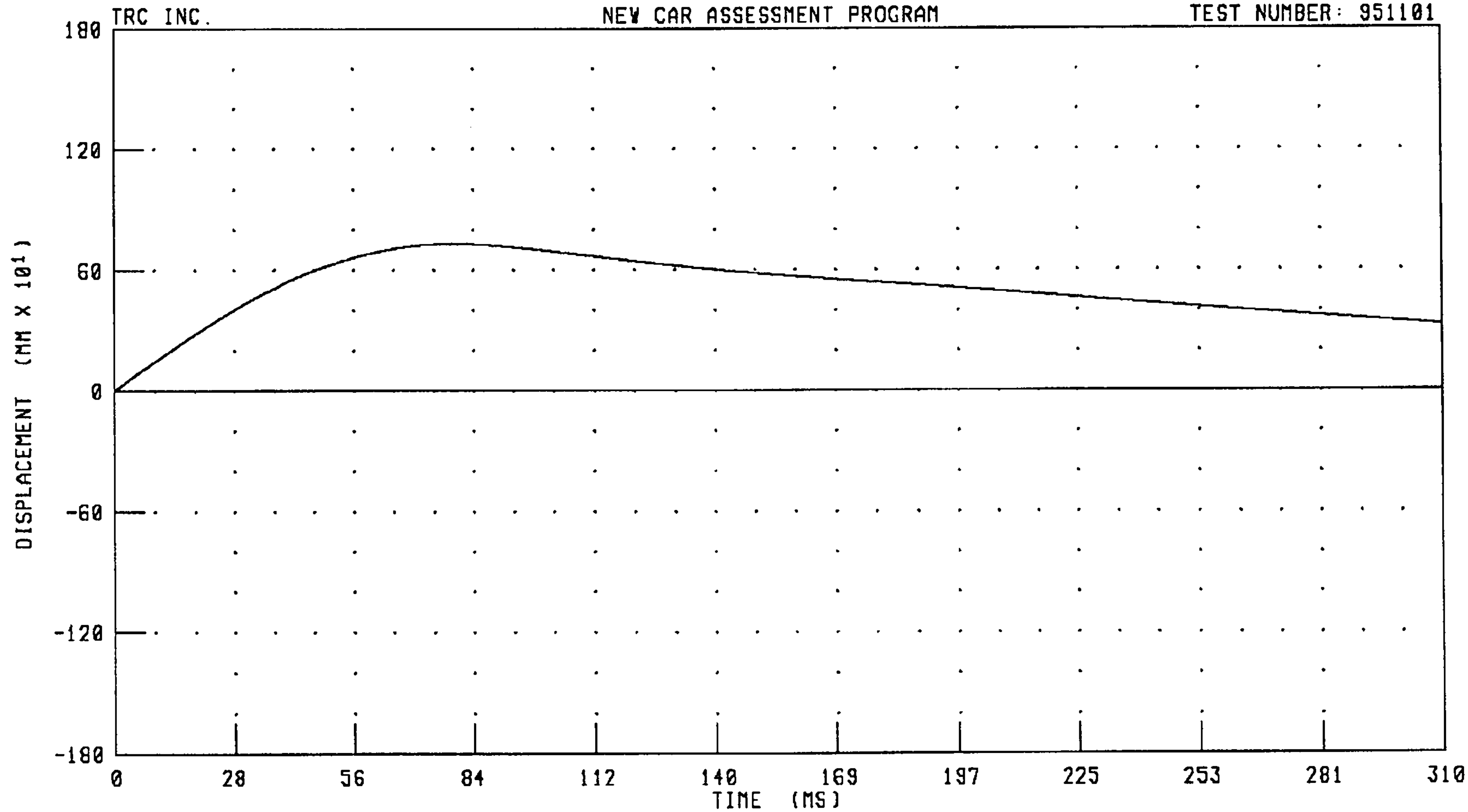
CHANNEL: TRRXG1   FILTER: CH. CLASS 60   PEAK DATA: 5.55 G @ 122.96 MS; -39.07 G @ 42.56 MS



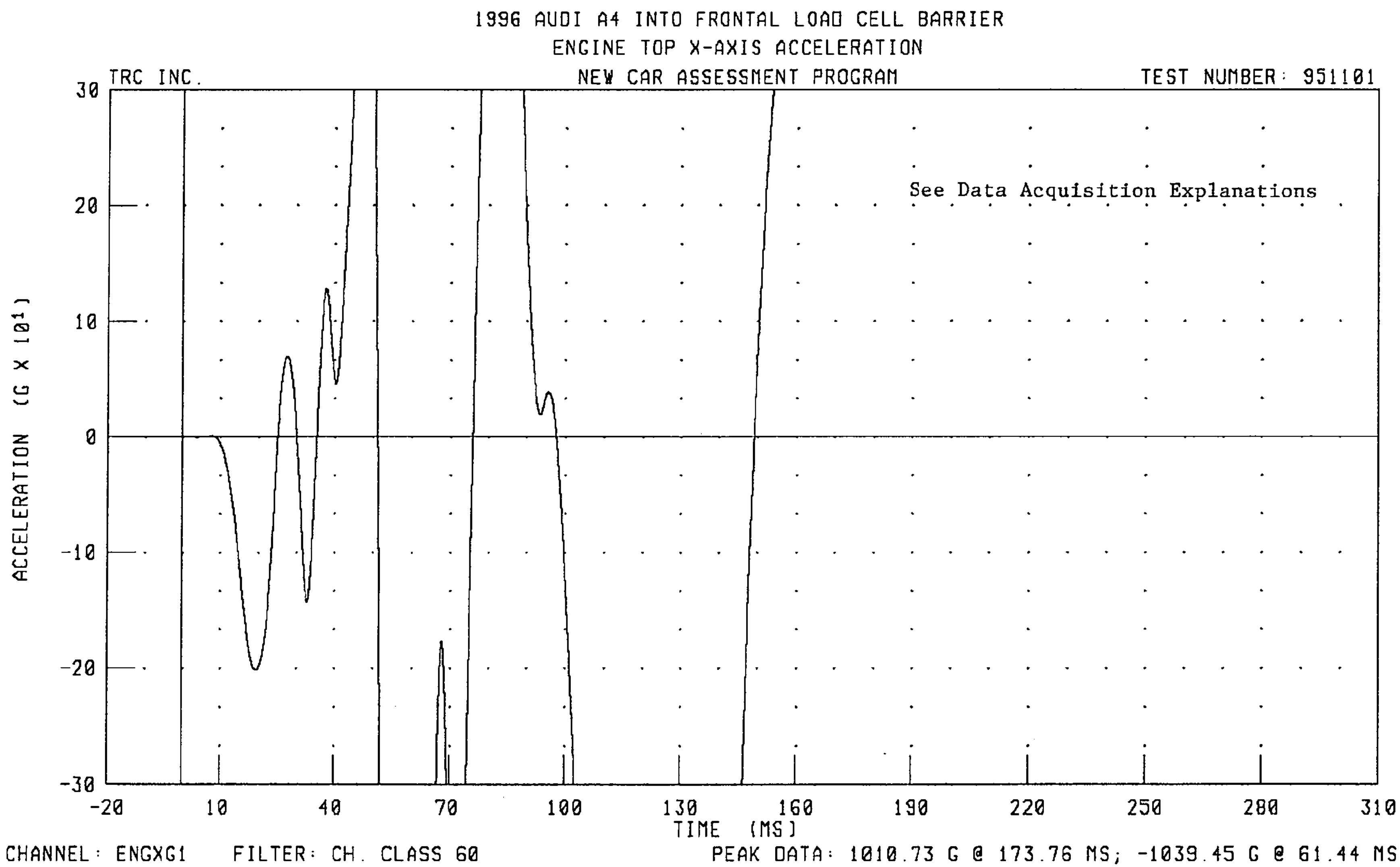
CHANNEL: TRRXV1 FILTER: CH. CLASS 180 PEAK DATA: 56.50 KM/H @ 0.00 MS; -9.44 KM/H @ 120.88 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
RIGHT REAR SEAT X-AXIS DISPLACEMENT
NEW CAR ASSESSMENT PROGRAM

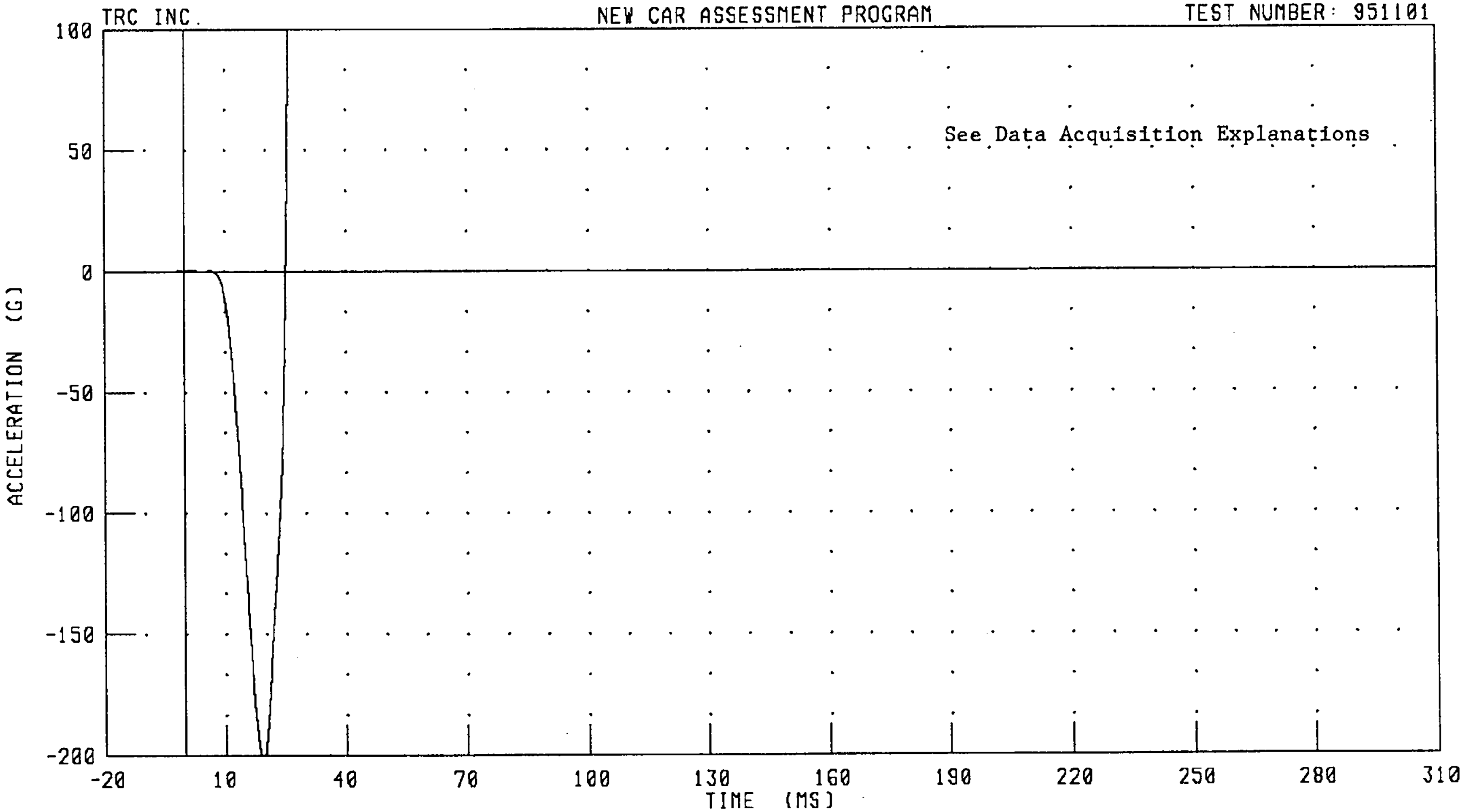
TRC INC. TEST NUMBER: 951101



CHANNEL: TRRXD1 FILTER: CH. CLASS 180 PEAK DATA: 731.89 MM @ 80.00 MS; 0.00 MM @ 0.00 MS

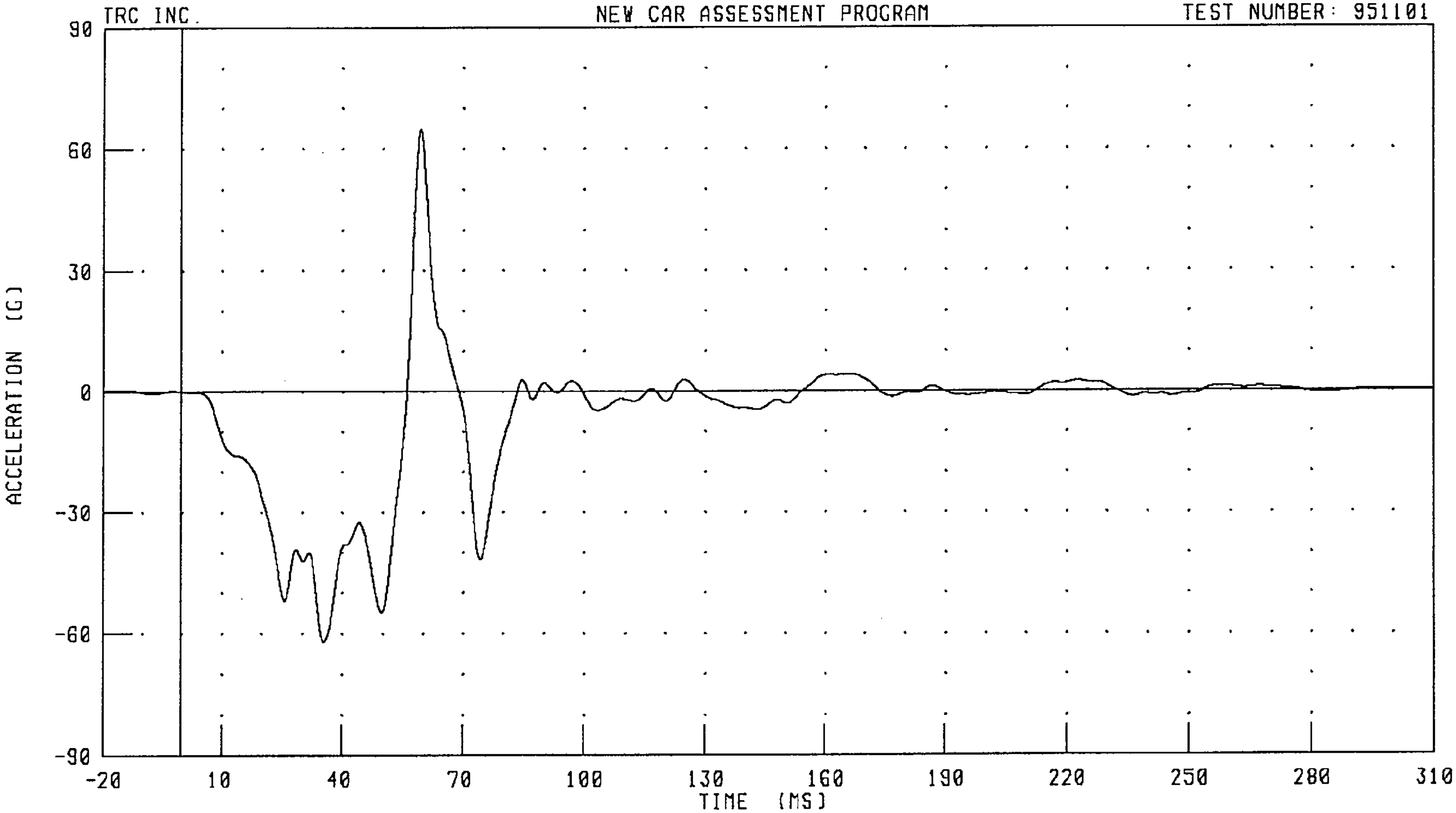

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
ENGINE TOP X-AXIS ACCELERATION
TRC INC.
NEW CAR ASSESSMENT PROGRAM
TEST NUMBER: 951101
See Data Acquisition Explanations
ACCELERATION (G X 10¹)
30
20
10
0
-10
-20
-30
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: ENGXG1
FILTER: CH. CLASS 60
PEAK DATA: 1010.73 G @ 173.76 MS; -1039.45 G @ 61.44 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
ENGINE BOTTOM X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM



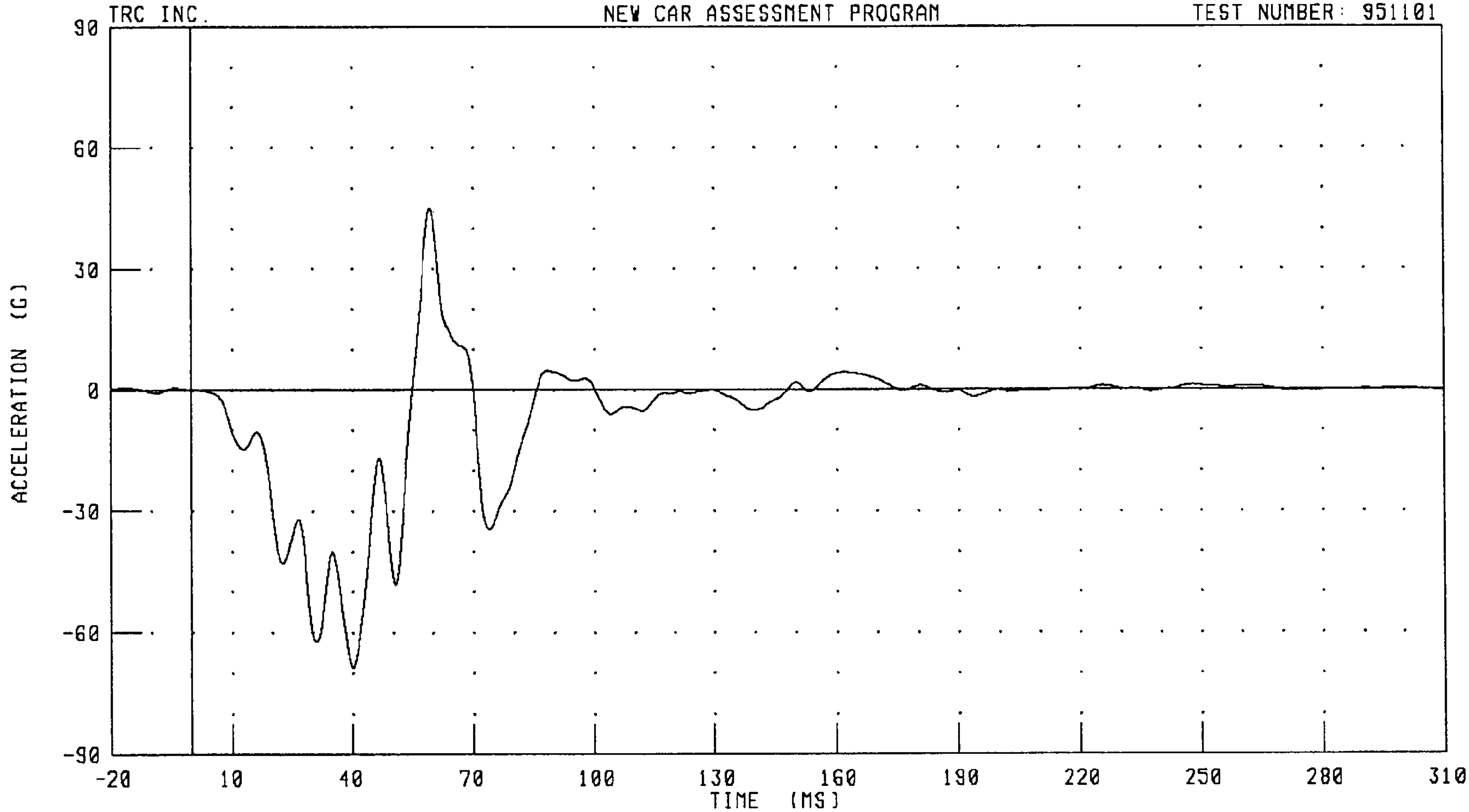
CHANNEL: ENGXG2 FILTER: CH. CLASS 60 PEAK DATA: 1032.32 G @ 32.00 MS; -203.27 G @ 19.12 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
RIGHT BRAKE CALIPER X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

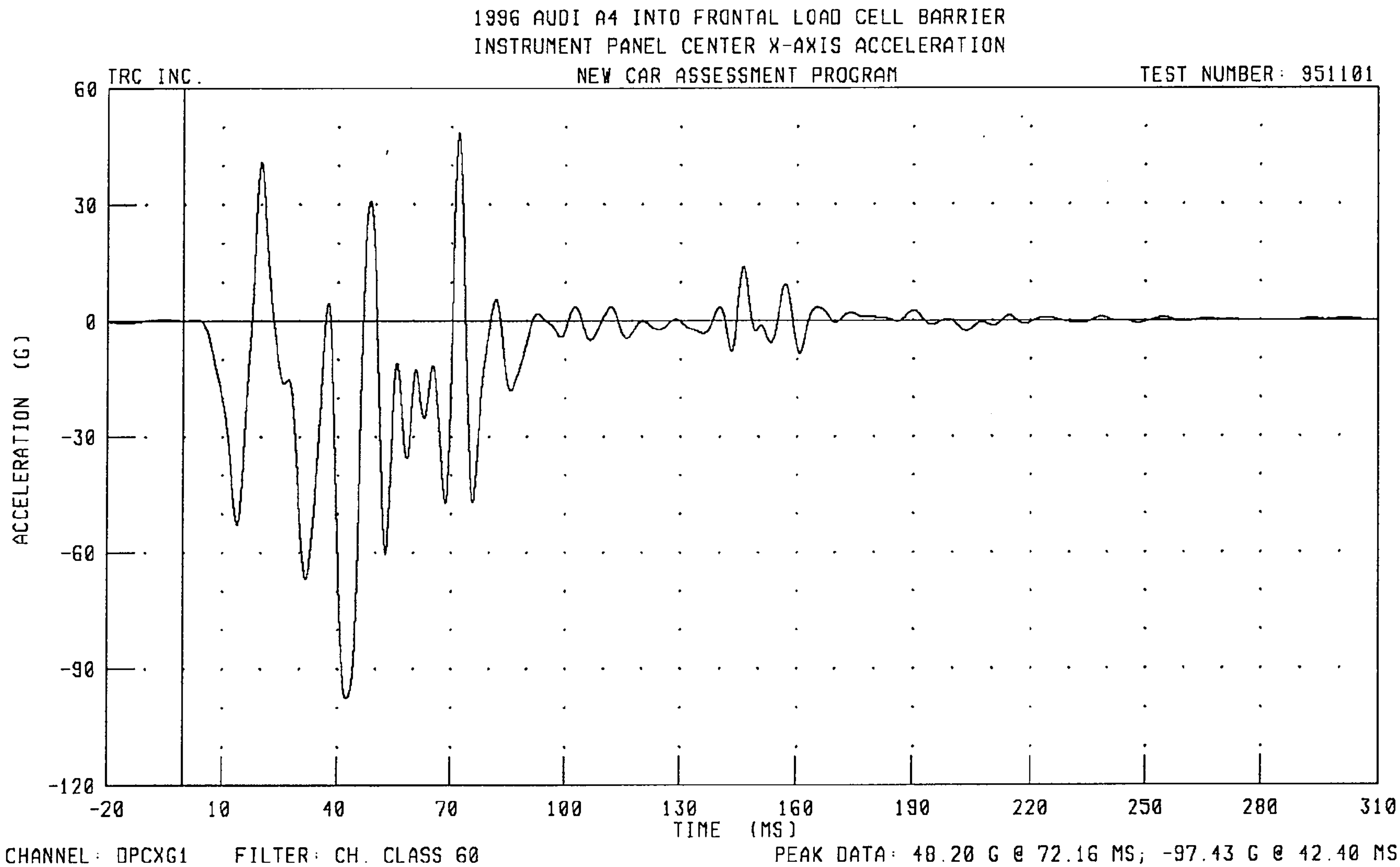


CHANNEL: BCRXG1 FILTER: CH. CLASS 60 PEAK DATA: 64.80 G @ 59.36 MS; -62.07 G @ 35.44 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
LEFT BRAKE CALIPER X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

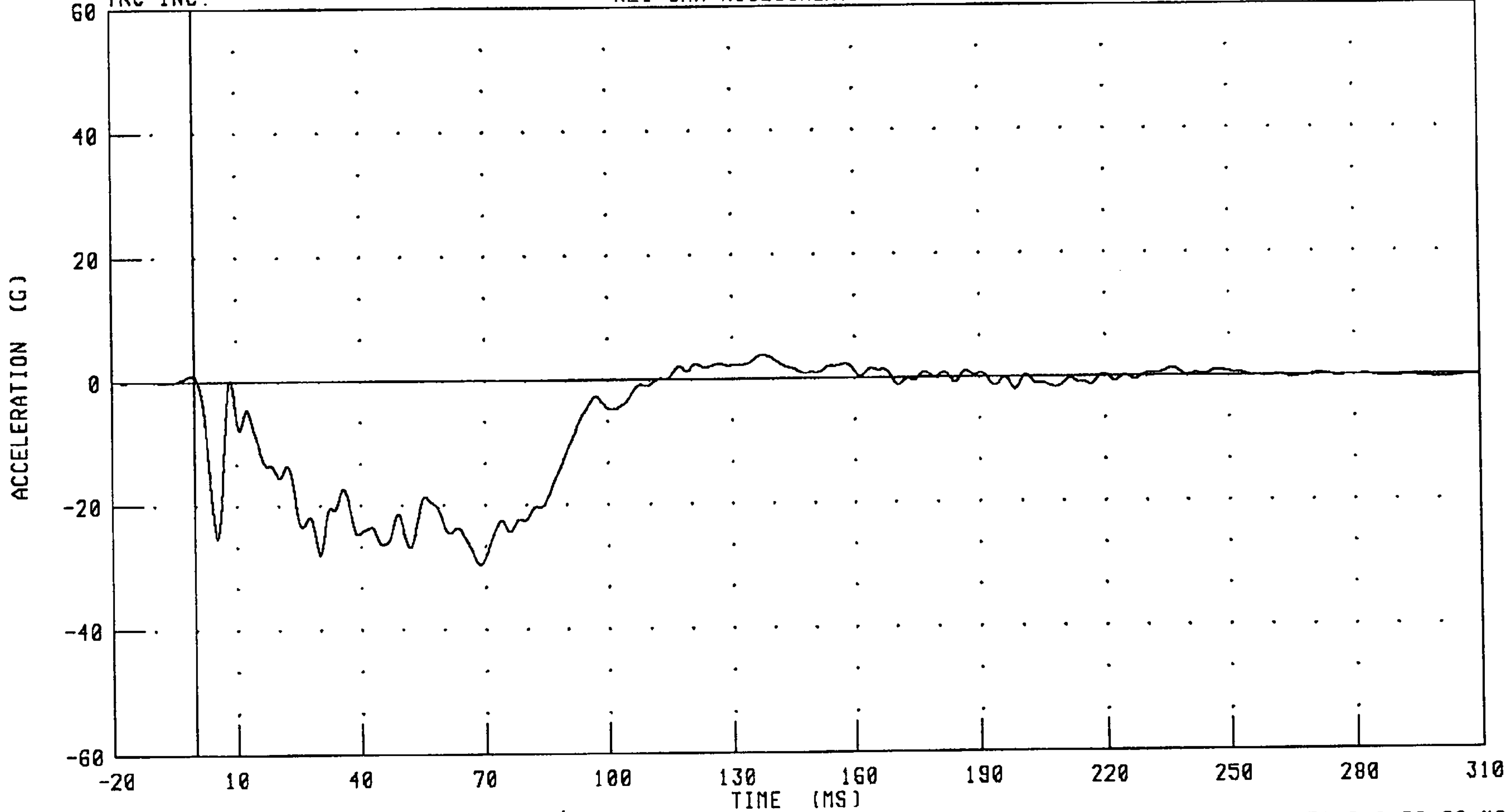


CHANNEL: BCLXG1 FILTER: CH. CLASS 60 PEAK DATA: 44.86 G @ 59.36 MS; -68.70 G @ 40.16 MS

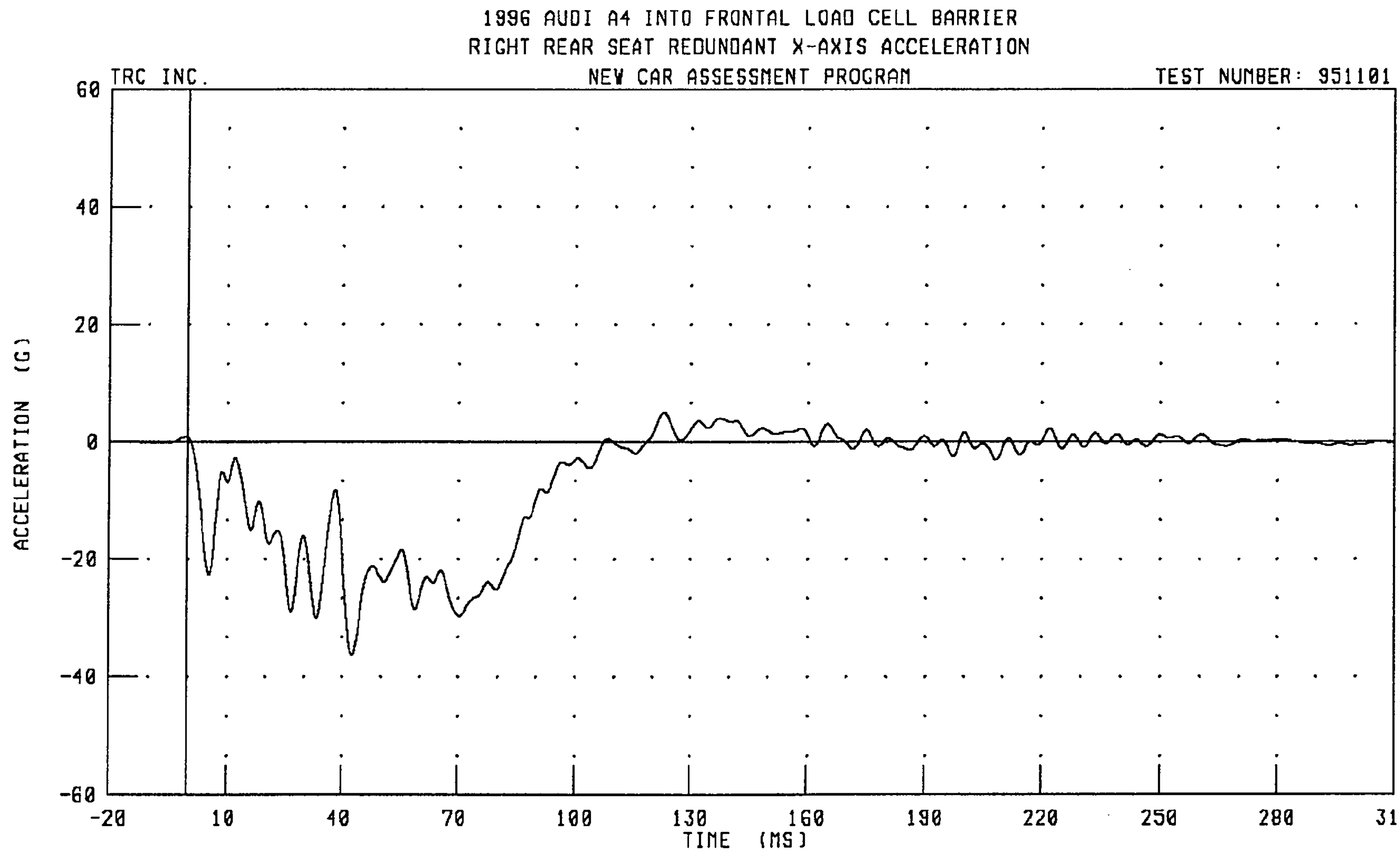

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
INSTRUMENT PANEL CENTER X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM
TRC INC.
TEST NUMBER: 951101
60
30
0
-30
-60
-90
-120
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: DPCXG1
FILTER: CH. CLASS 60
PEAK DATA: 48.20 G @ 72.16 MS; -97.43 G @ 42.40 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT REDUNDANT X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TRC INC. TEST NUMBER: 951101



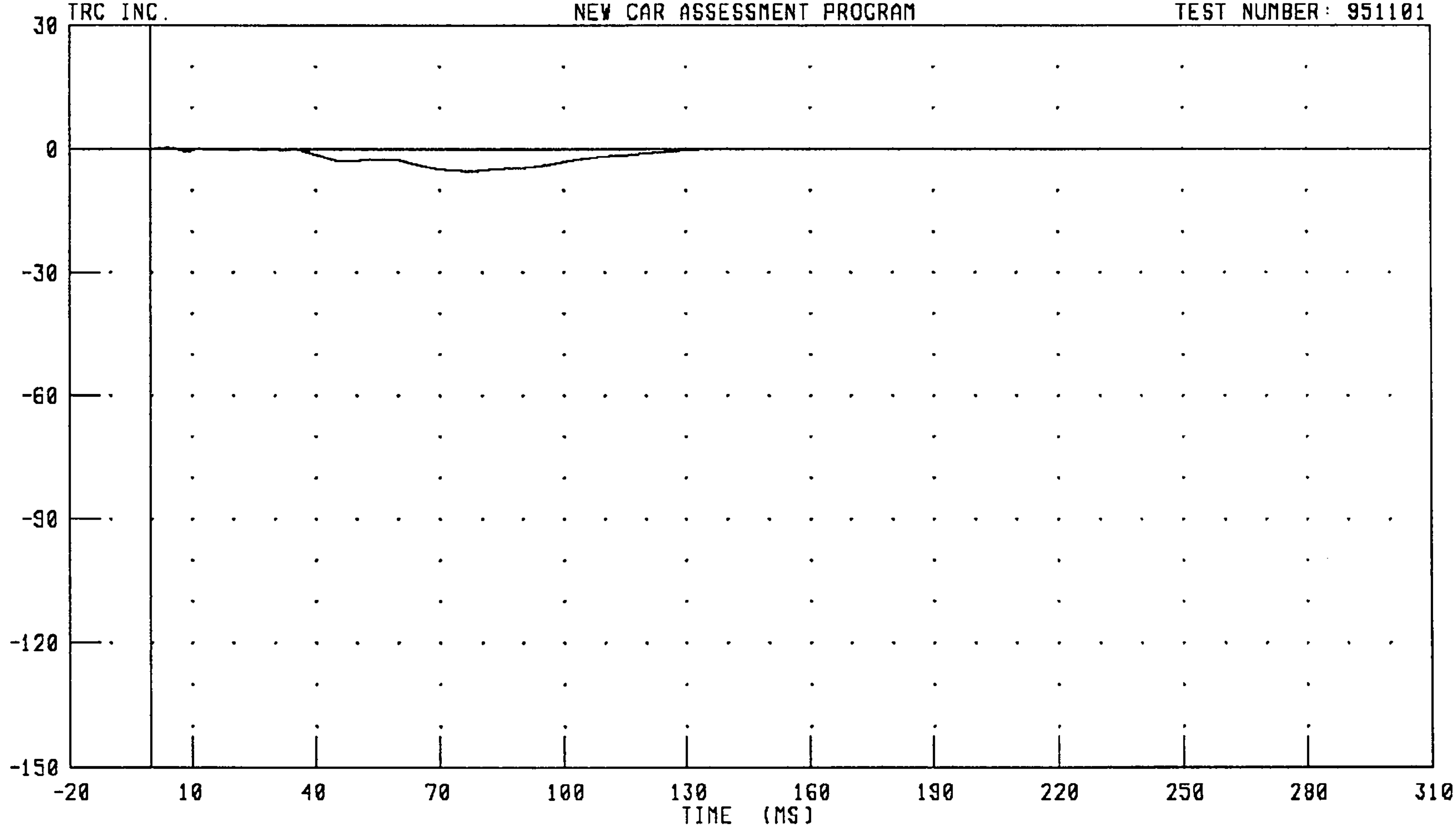
CHANNEL: TLRXGA FILTER: CH. CLASS 60 PEAK DATA: 3.73 G @ 137.36 MS; -29.71 G @ 68.80 MS



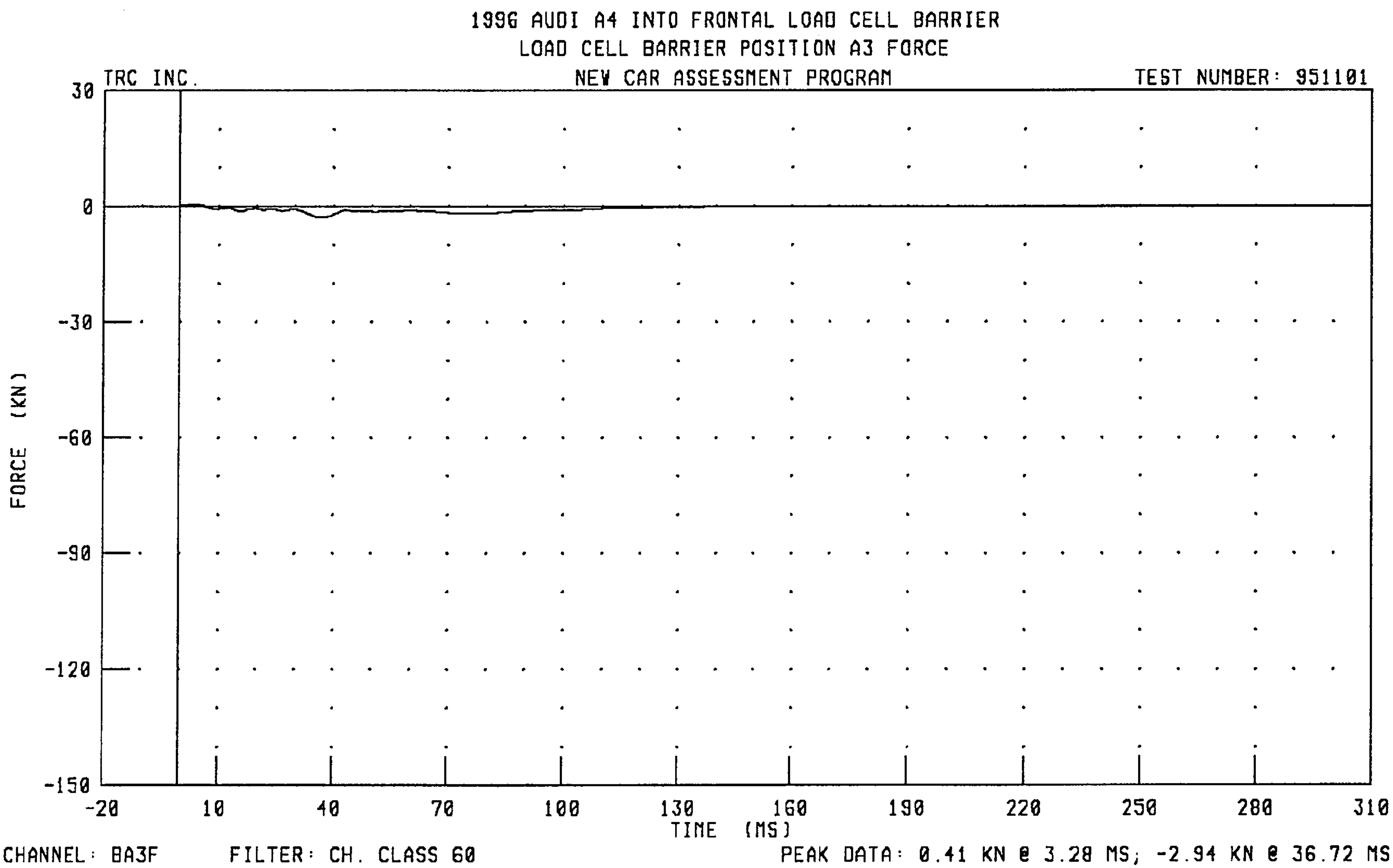
CHANNEL: TRRXGA FILTER: CH. CLASS 60 PEAK DATA: 5.00 G @ 122.96 MS; -36.37 G @ 42.56 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A2 FORCE
NEW CAR ASSESSMENT PROGRAM

TRC INC. TEST NUMBER: 951101

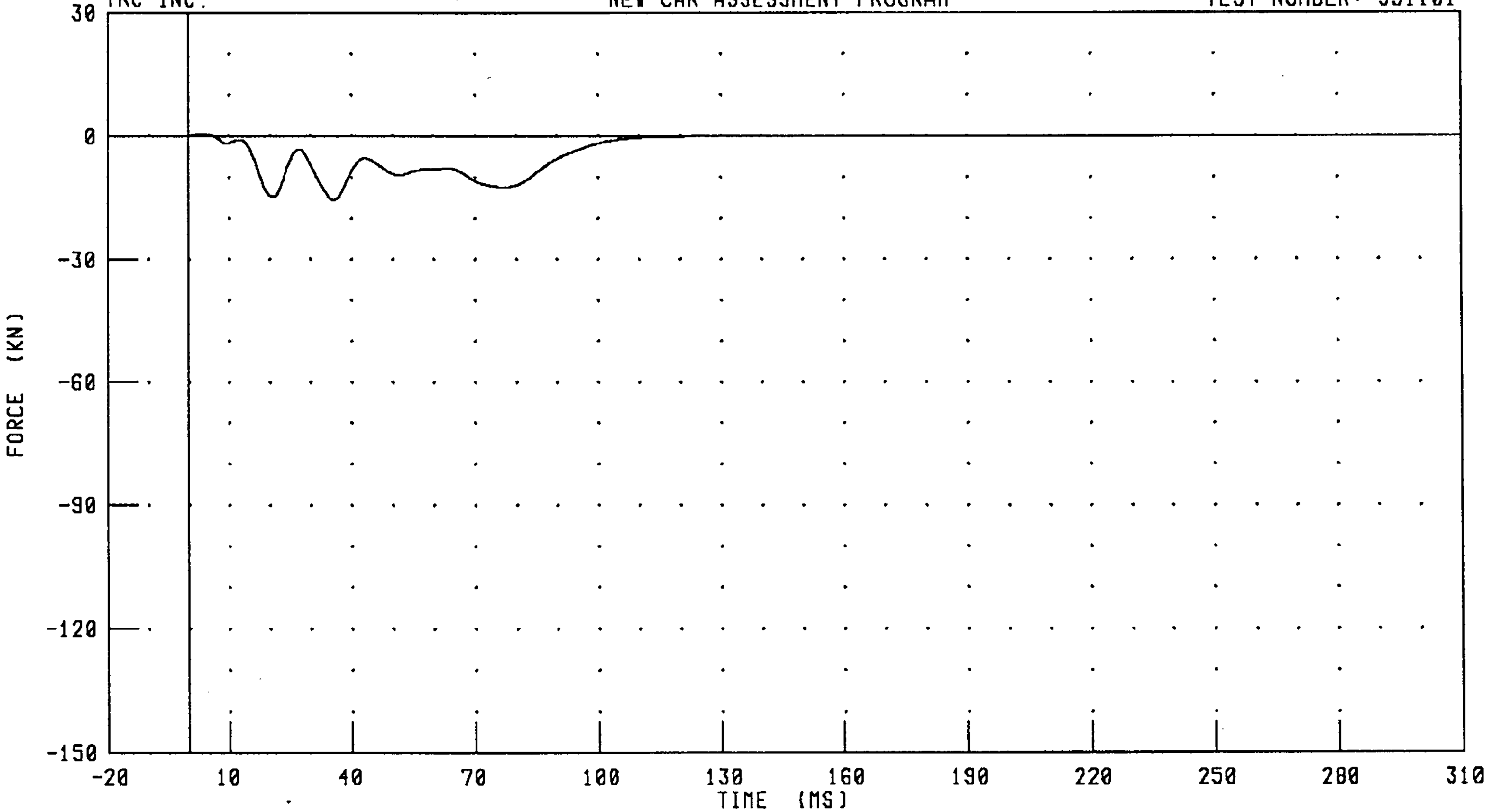


CHANNEL: BA2F FILTER: CH. CLASS 60 PEAK DATA: 0.35 KN @ 3.84 MS; -5.28 KN @ 78.32 MS


1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A3 FORCE
NEW CAR ASSESSMENT PROGRAM
TRC INC.
TEST NUMBER: 951101
FORCE (KN)
30
0
-30
-60
-90
-120
-150
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BA3F
FILTER: CH. CLASS 60
PEAK DATA: 0.41 KN @ 3.28 MS; -2.94 KN @ 36.72 MS

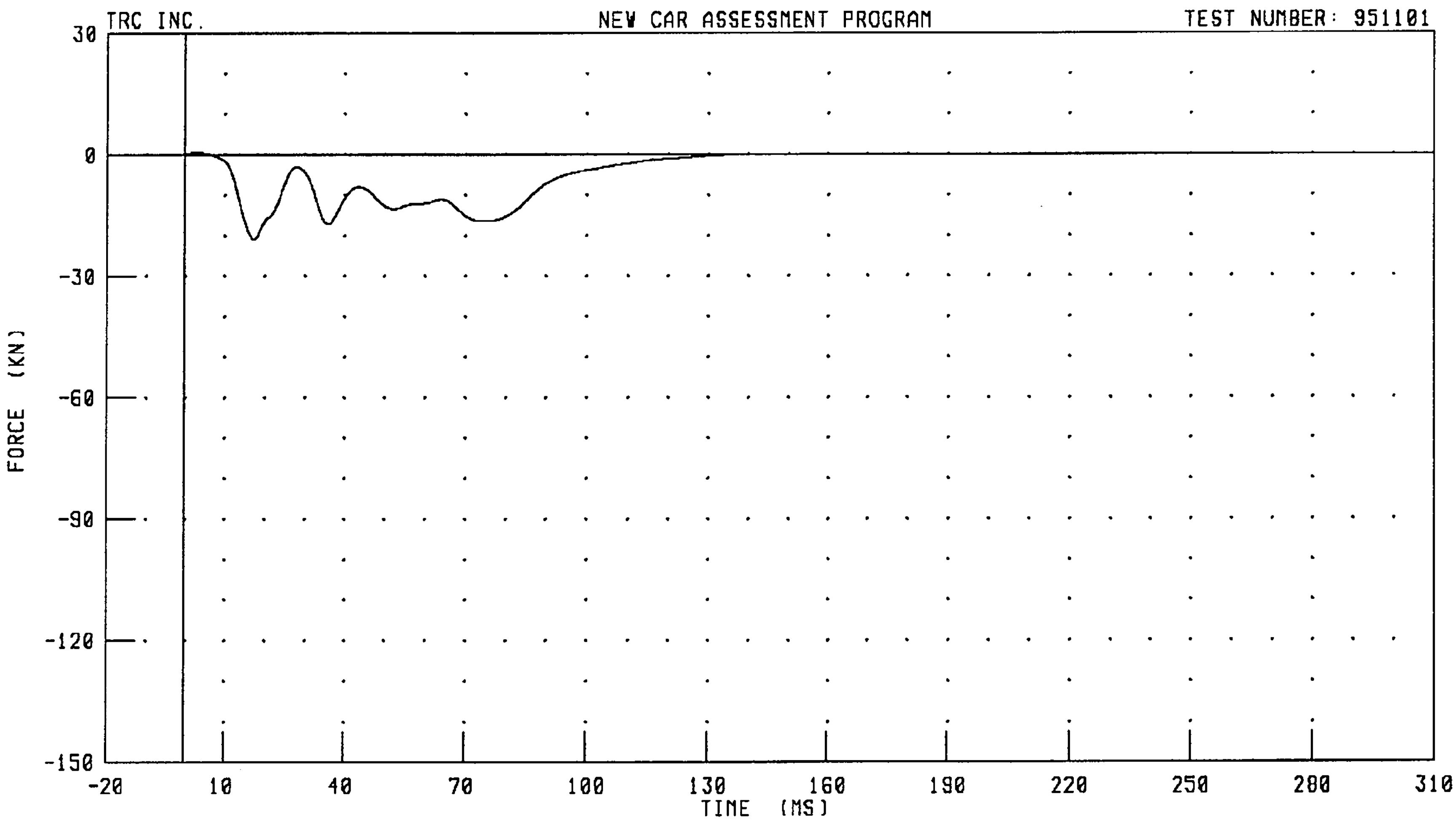
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A4 FORCE
NEW CAR ASSESSMENT PROGRAM

TRC INC. TEST NUMBER: 951101



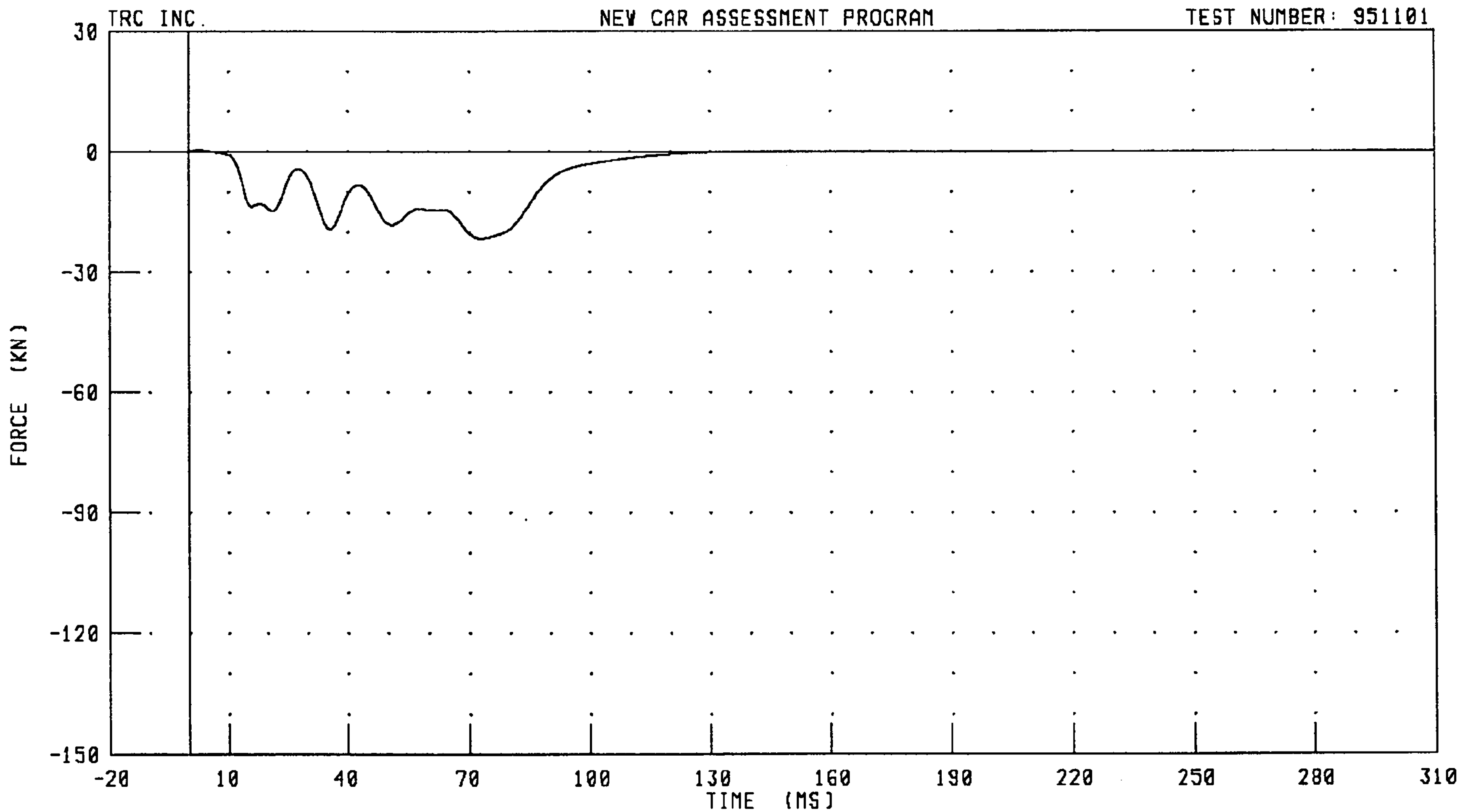
CHANNEL: BA4F FILTER: CH. CLASS 60 PEAK DATA: 0.48 KN @ 4.08 MS; -15.54 KN @ 35.76 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A5 FORCE
NEW CAR ASSESSMENT PROGRAM



CHANNEL: BA5F FILTER: CH. CLASS 60 PEAK DATA: 0.47 KN @ 2.72 MS; -20.82 KN @ 17.36 MS

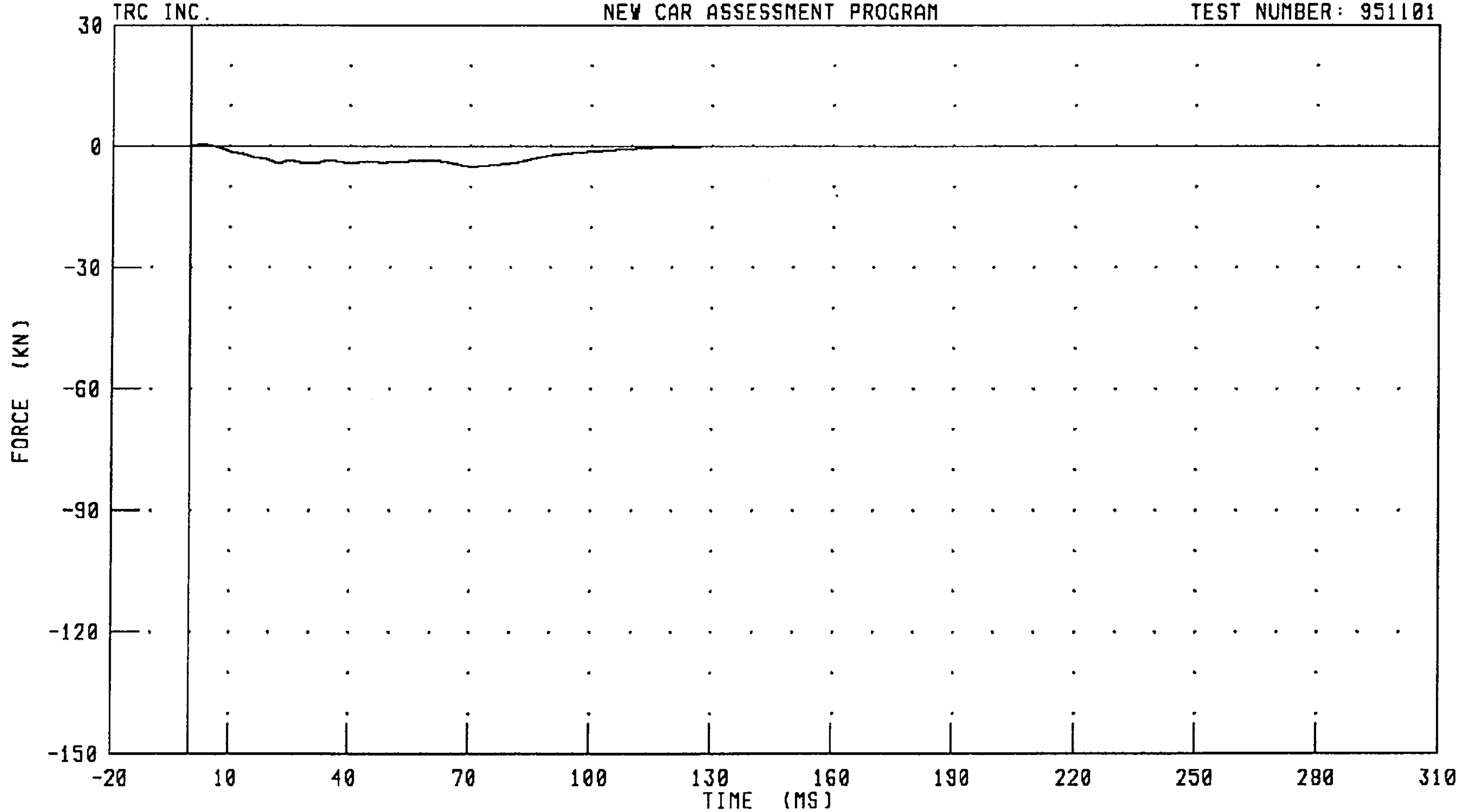
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A6 FORCE
NEW CAR ASSESSMENT PROGRAM



CHANNEL: BA6F FILTER: CH. CLASS 60 PEAK DATA: 0.43 KN @ 2.56 MS; -21.59 KN @ 73.12 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A7 FORCE
NEW CAR ASSESSMENT PROGRAM

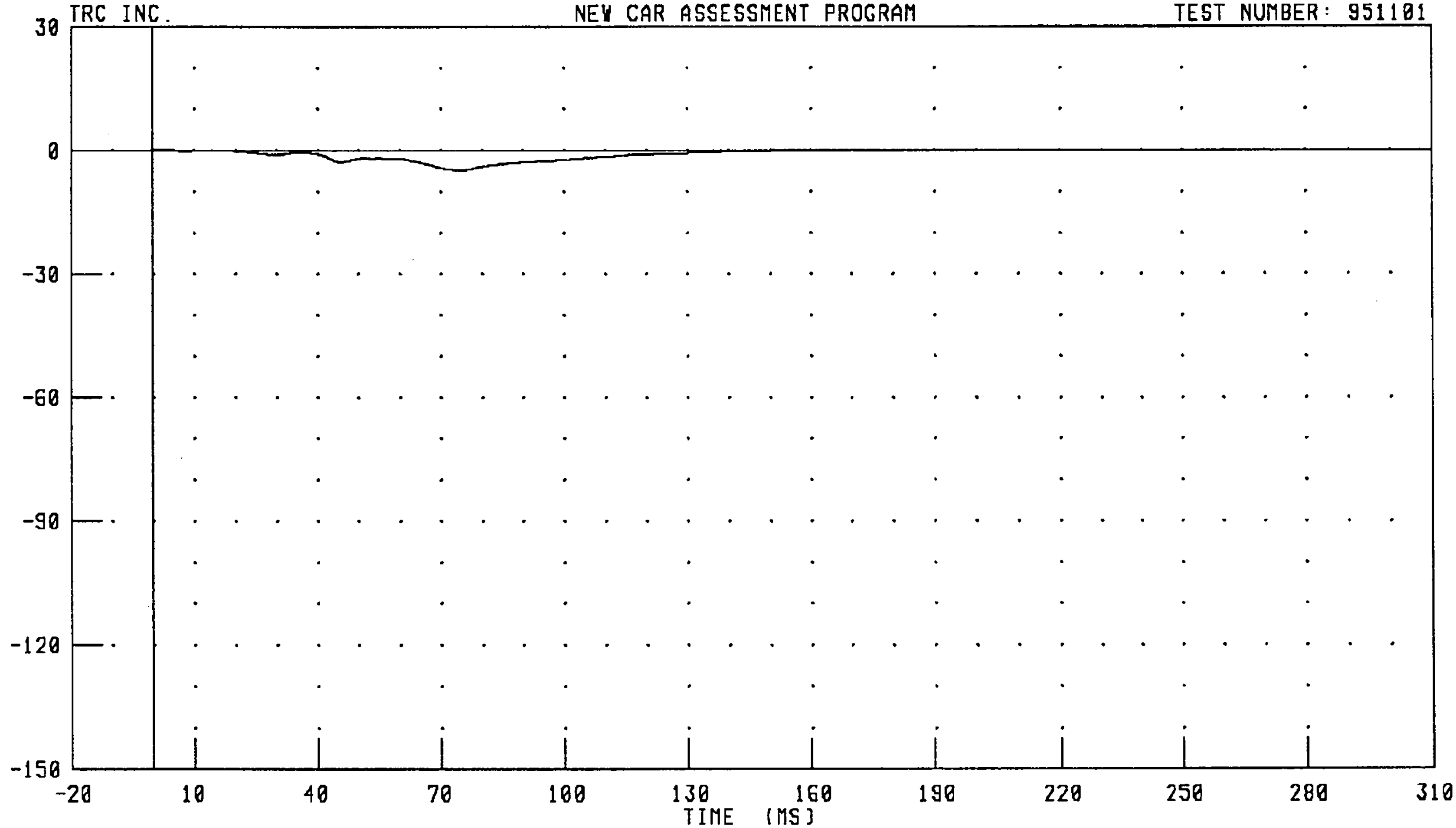
TRC INC. TEST NUMBER: 951101



CHANNEL: BA7F FILTER: CH. CLASS 60 PEAK DATA: 0.42 KN @ 2.80 MS; -5.06 KN @ 70.72 MS

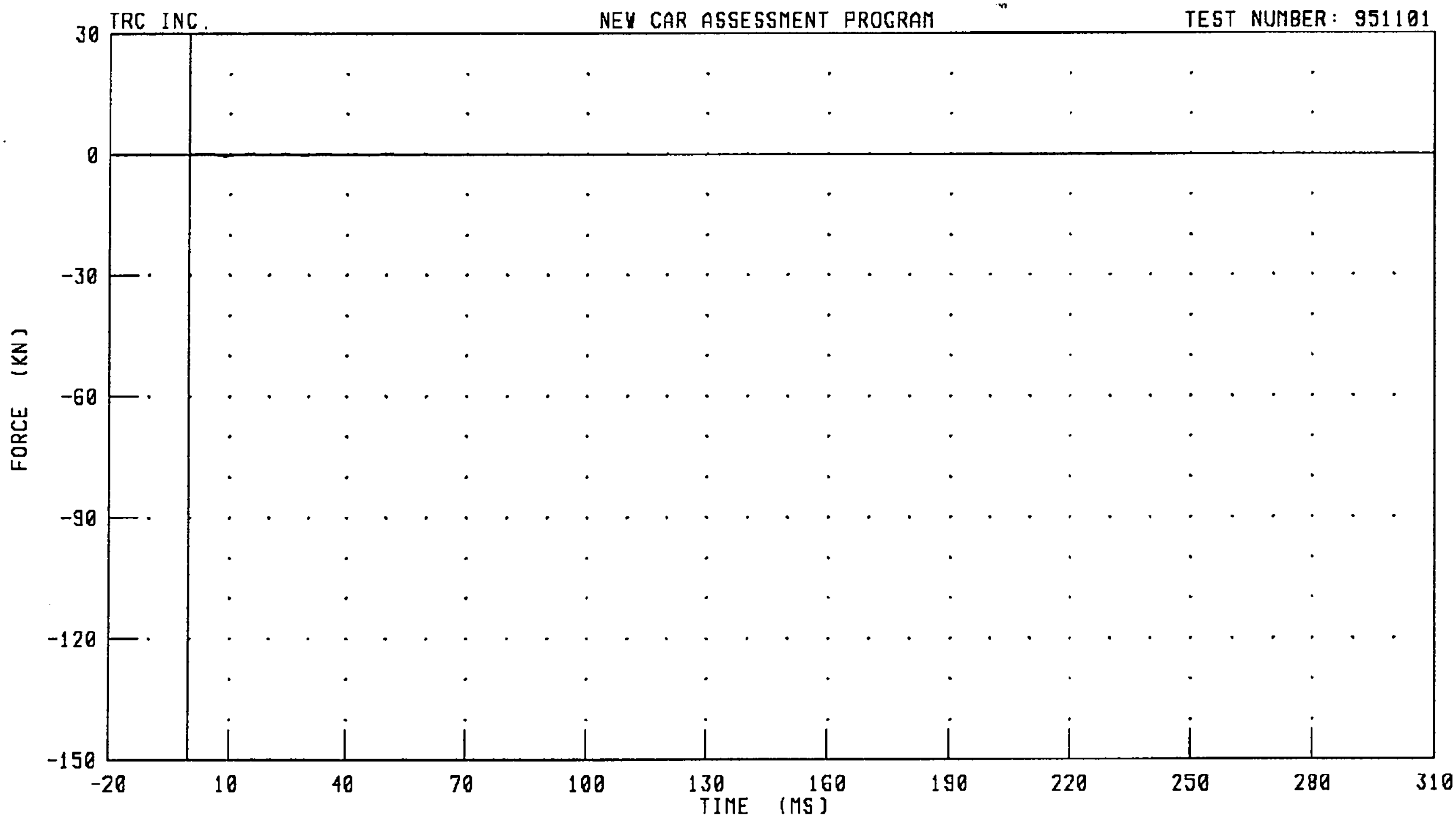
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A8 FORCE
NEW CAR ASSESSMENT PROGRAM

TRC INC. TEST NUMBER: 951101



CHANNEL: BA8F FILTER: CH. CLASS 60 PEAK DATA: 0.30 KN @ 2.88 MS; -4.86 KN @ 74.72 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B1 FORCE
NEW CAR ASSESSMENT PROGRAM

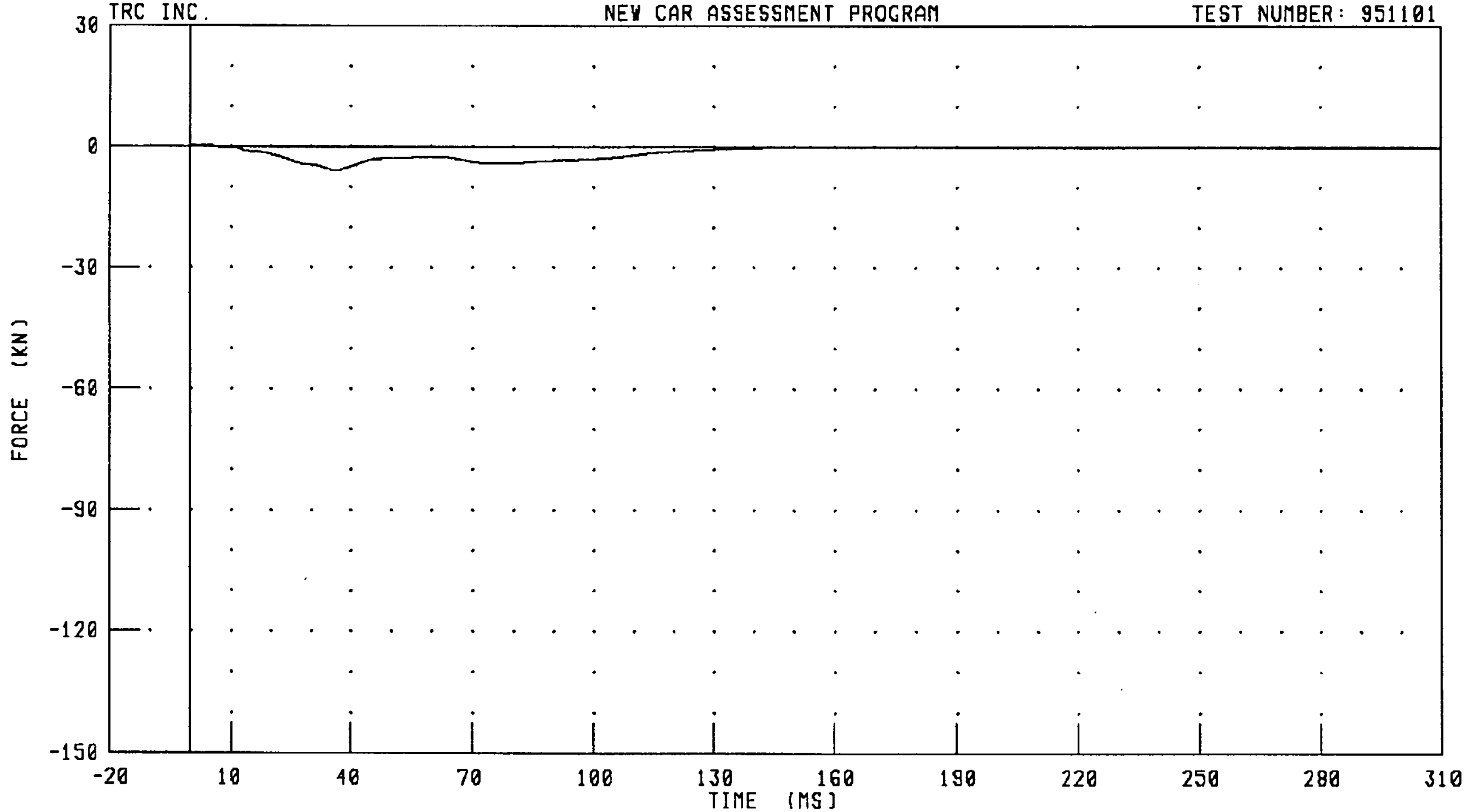


CHANNEL: BB1F FILTER: CH. CLASS 60 PEAK DATA: 0.33 KN @ 3.92 MS; -0.46 KN @ 8.80 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B2 FORCE
NEW CAR ASSESSMENT PROGRAM

TRC INC.

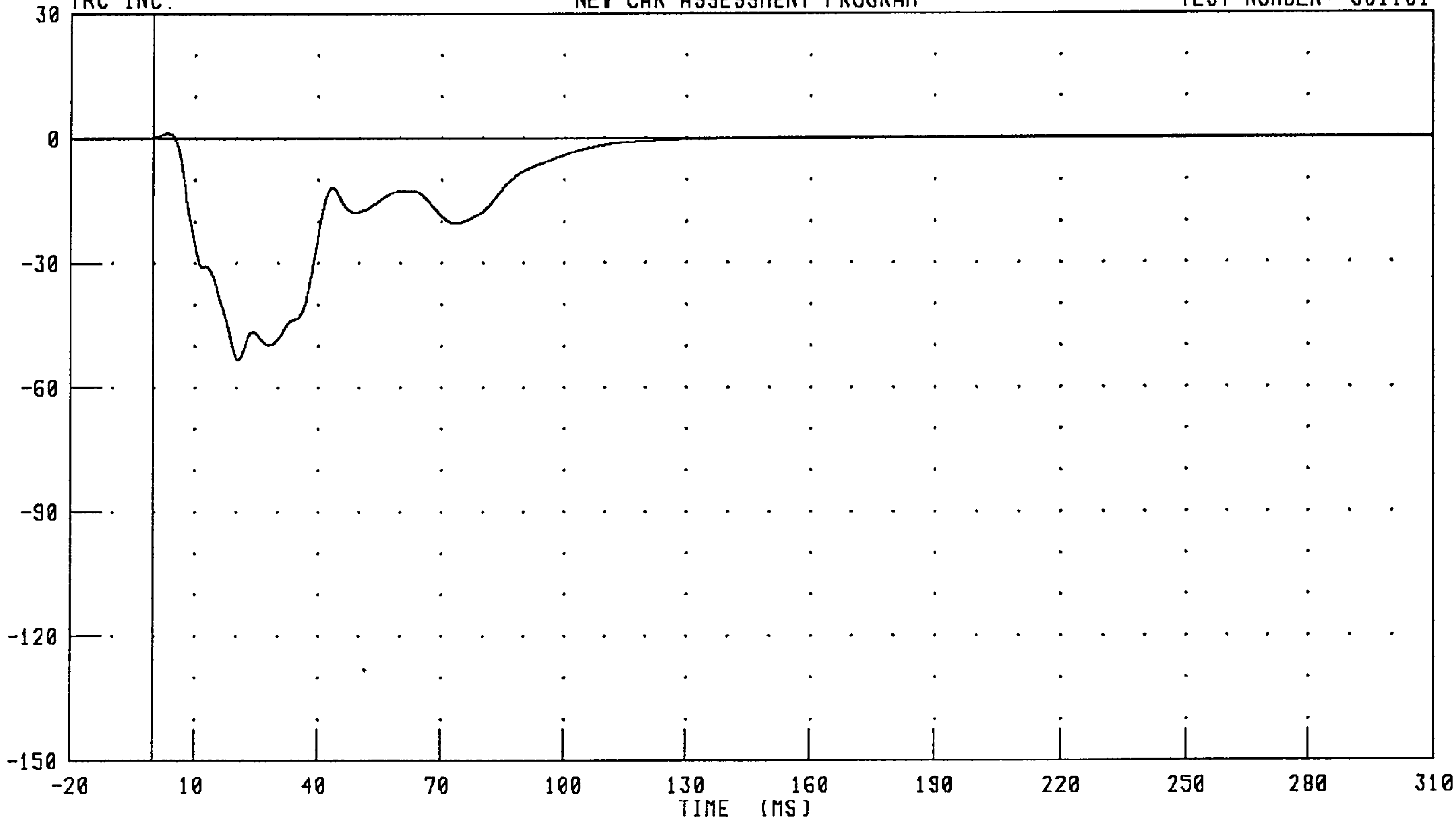
TEST NUMBER: 951101



CHANNEL: BB2F FILTER: CH. CLASS 60 PEAK DATA: 0.32 KN @ 3.20 MS; -5.98 KN @ 36.24 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B3 FORCE
NEW CAR ASSESSMENT PROGRAM

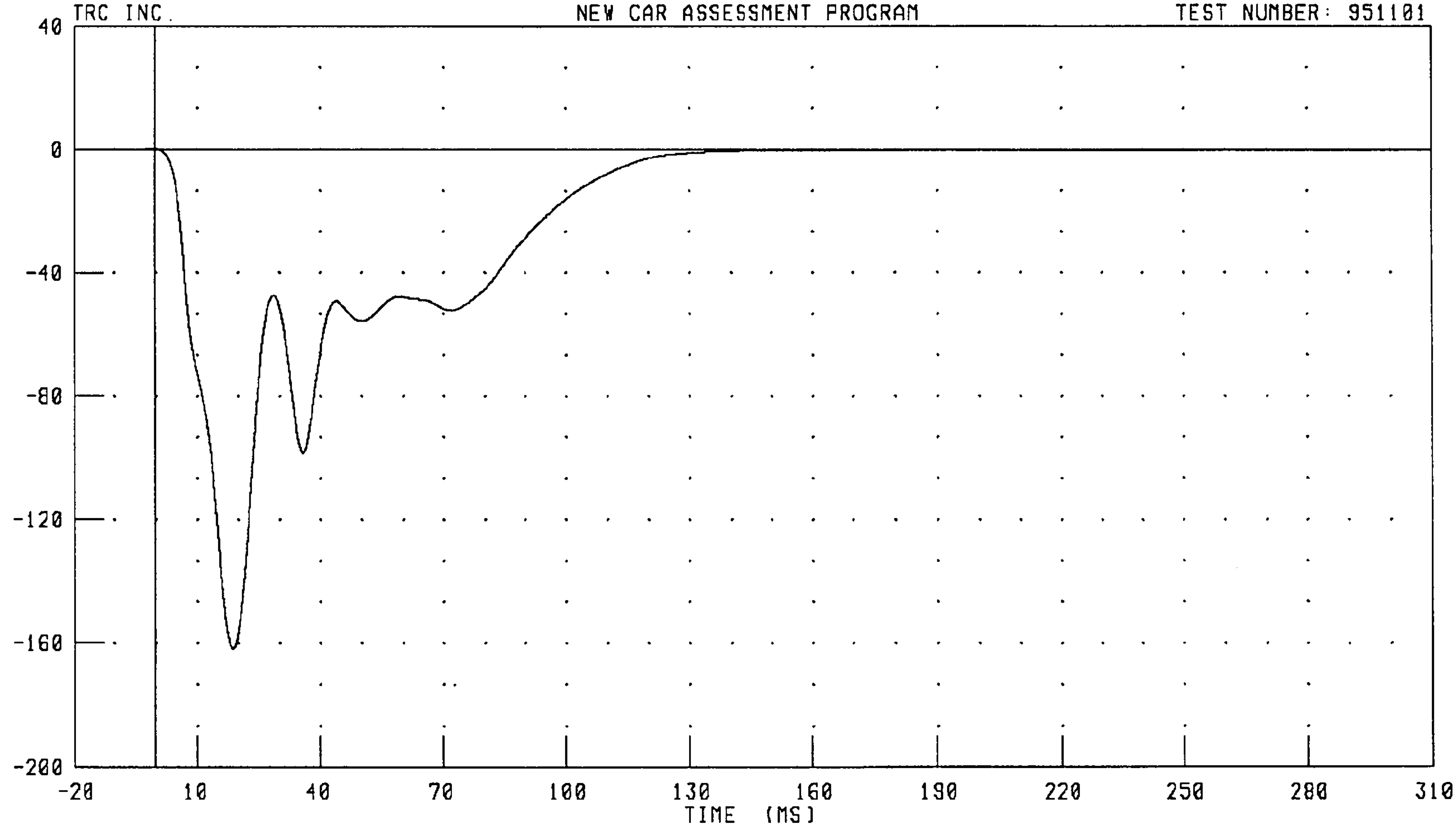
TRC INC. TEST NUMBER: 951101



CHANNEL: BB3F FILTER: CH. CLASS 60 PEAK DATA: 1.13 KN @ 3.44 MS; -53.30 KN @ 20.48 MS

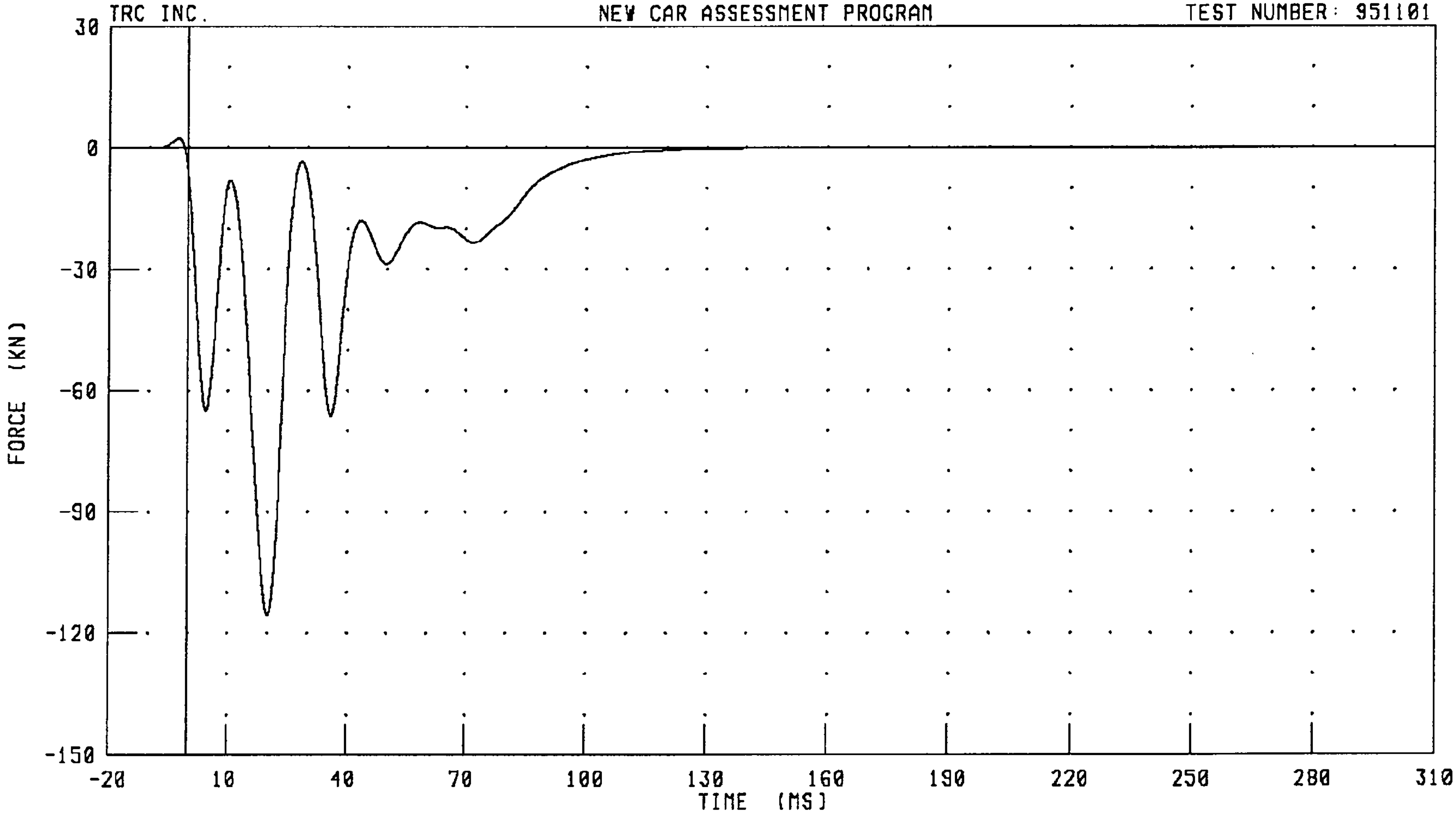
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B4 FORCE
NEW CAR ASSESSMENT PROGRAM

TRC INC. TEST NUMBER: 951101



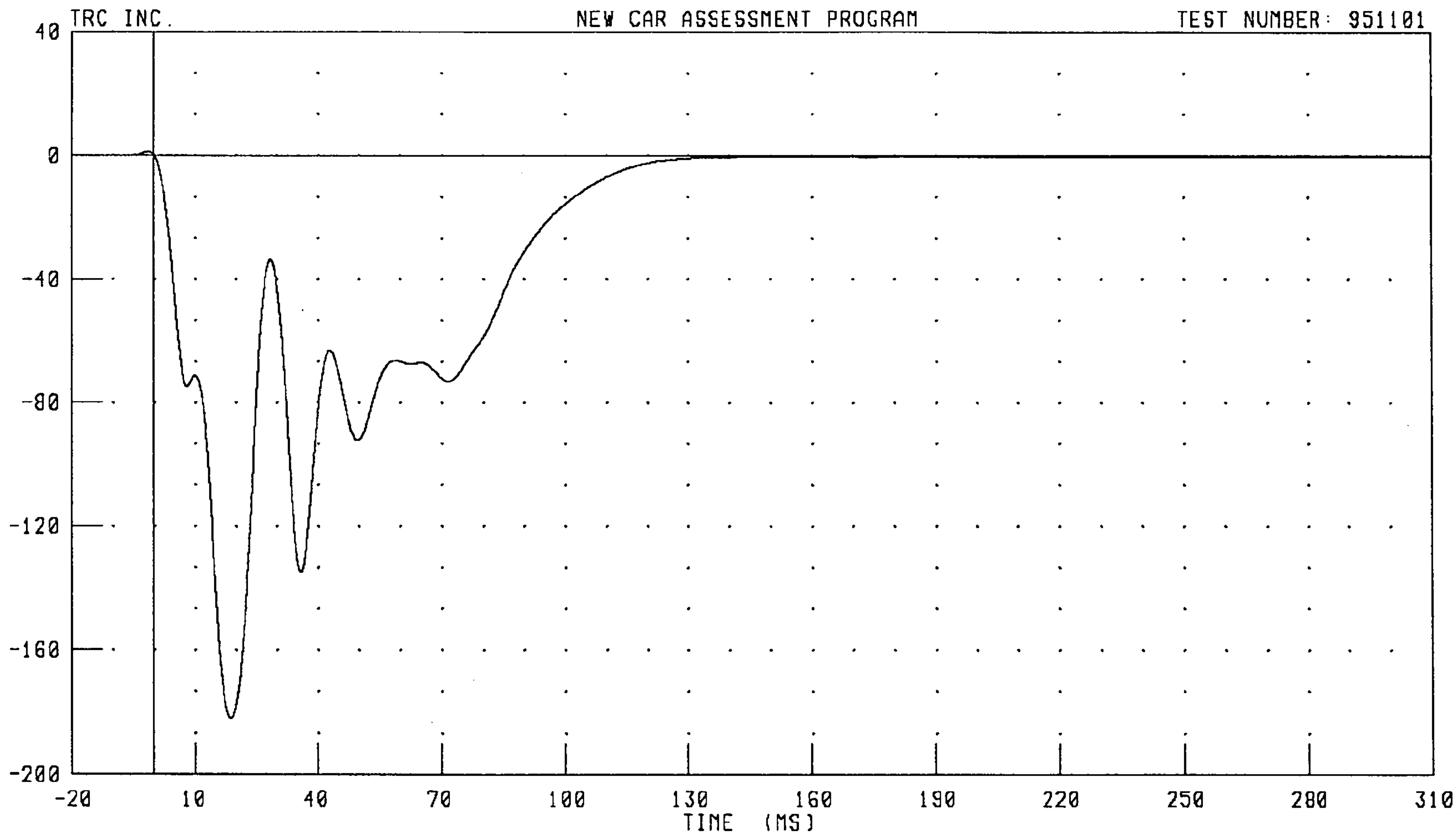
CHANNEL: BB4F FILTER: CH. CLASS 60 PEAK DATA: 0.25 KN @ -0.48 MS; -161.88 KN @ 18.80 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B5 FORCE
NEW CAR ASSESSMENT PROGRAM



CHANNEL: BB5F FILTER: CH. CLASS 60 PEAK DATA: 2.17 KN @ -2.56 MS; -115.73 KN @ 20.16 MS

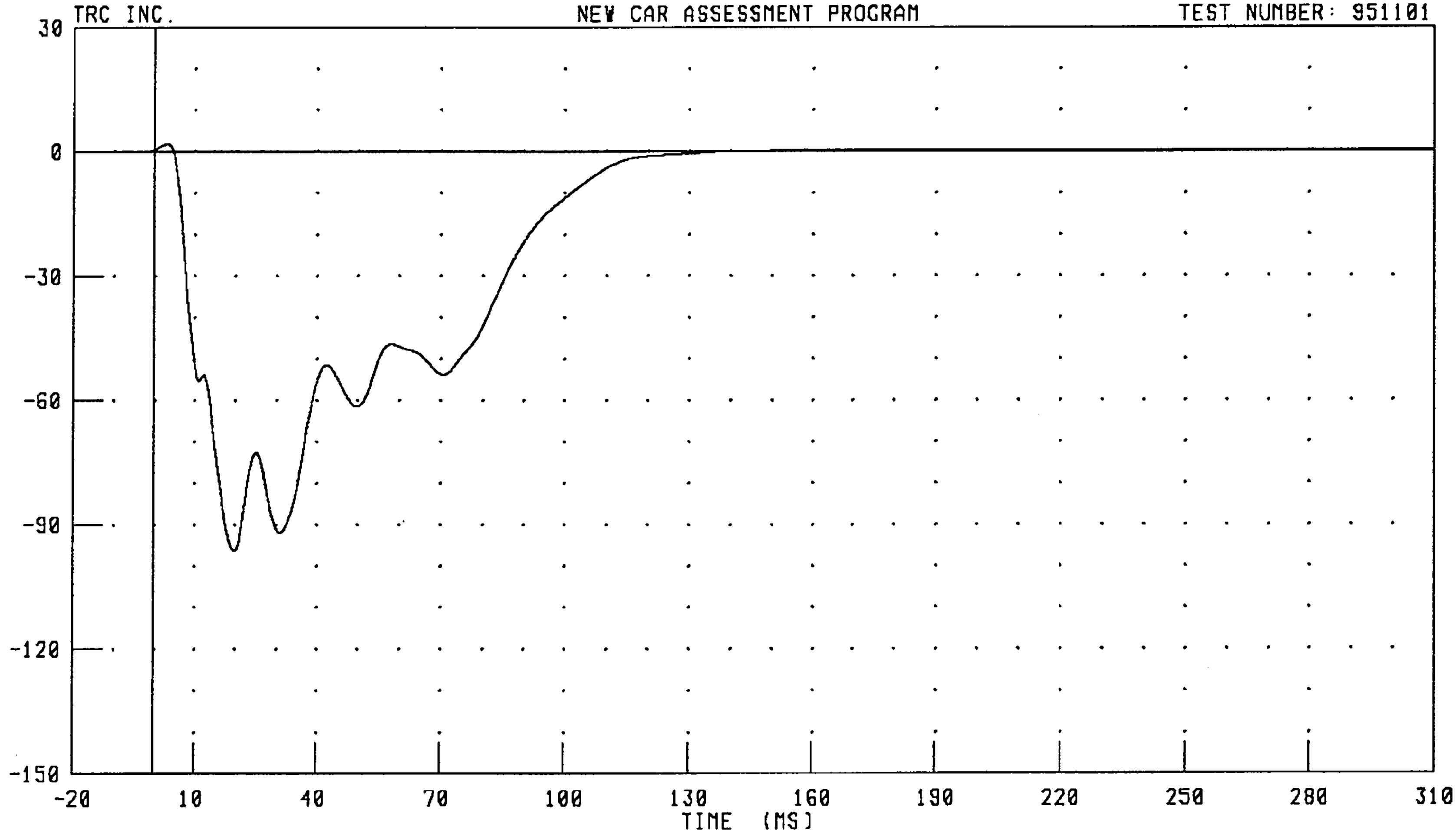
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B6 FORCE
NEW CAR ASSESSMENT PROGRAM



CHANNEL: BB6F FILTER: CH. CLASS 60 PEAK DATA: 1.16 KN @ -1.44 MS; -182.08 KN @ 18.64 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B7 FORCE
NEW CAR ASSESSMENT PROGRAM

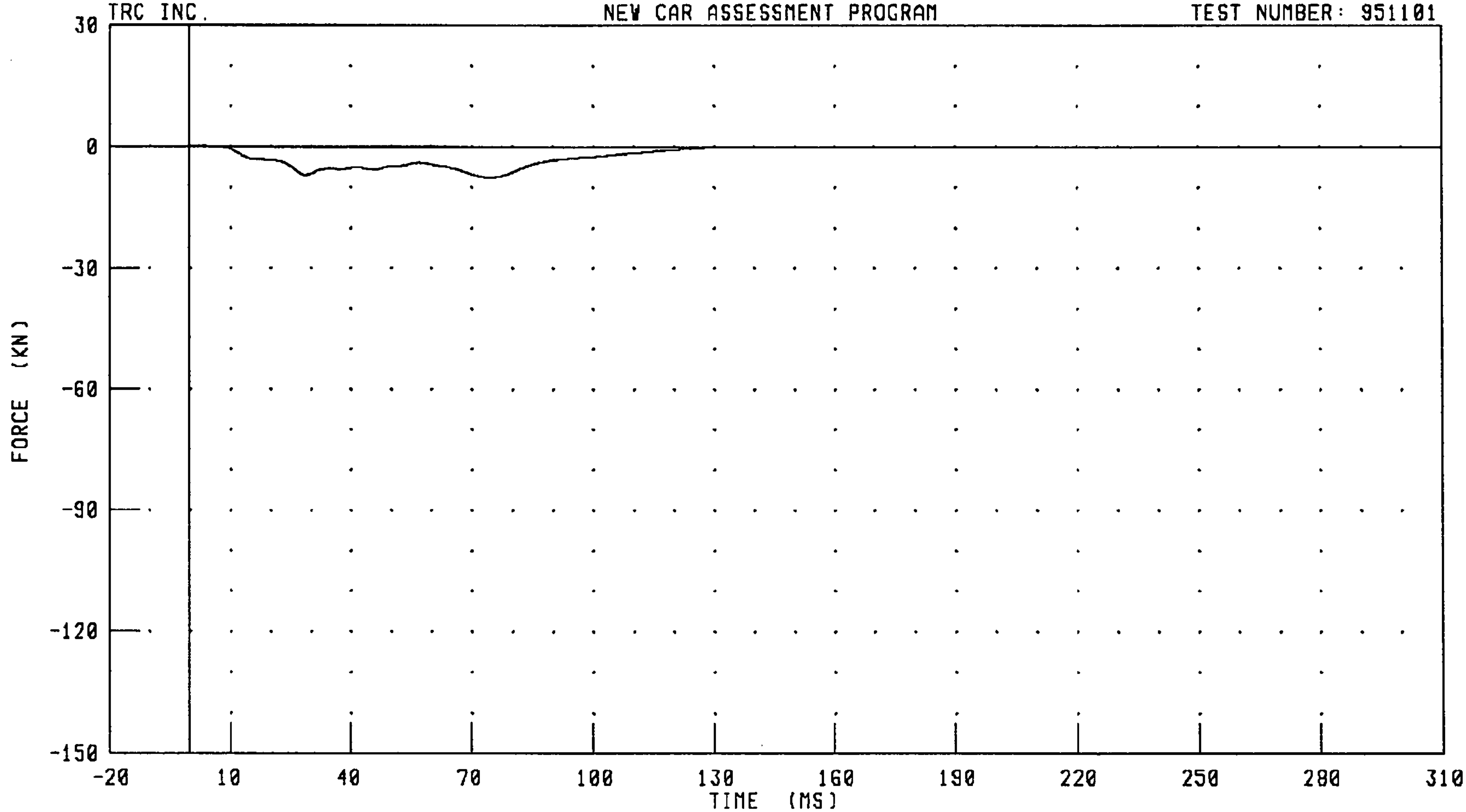
TRC INC. TEST NUMBER: 951101



CHANNEL: BB7F FILTER: CH. CLASS 60 PEAK DATA: 1.79 KN @ 3.04 MS; -96.39 KN @ 19.92 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B8 FORCE
NEW CAR ASSESSMENT PROGRAM

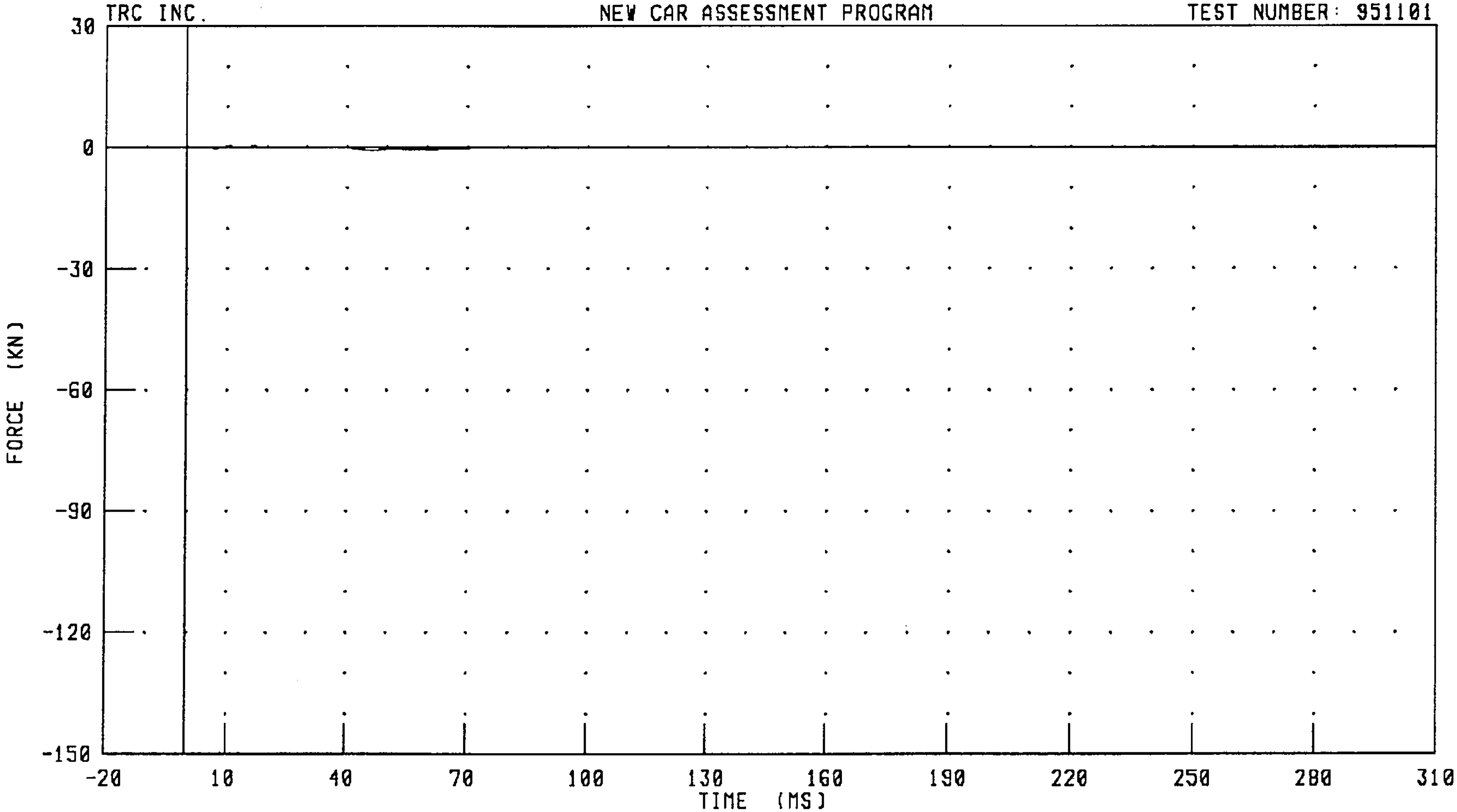
TRC INC. TEST NUMBER: 951101



CHANNEL: B8BF FILTER: CH. CLASS 60 PEAK DATA: 0.19 KN @ 2.24 MS; -7.60 KN @ 74.72 MS

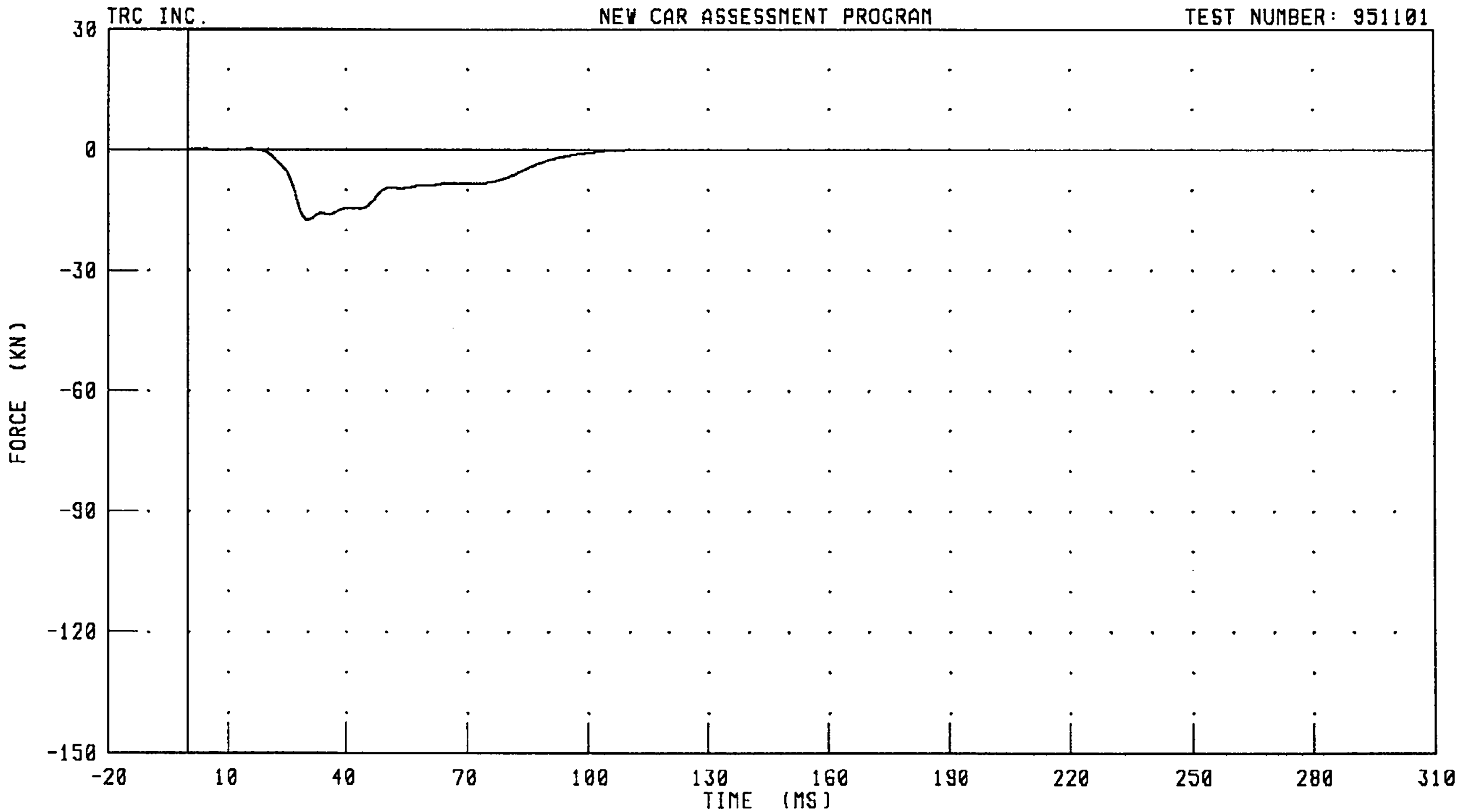
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B9 FORCE
NEW CAR ASSESSMENT PROGRAM

TRC INC. TEST NUMBER: 951101



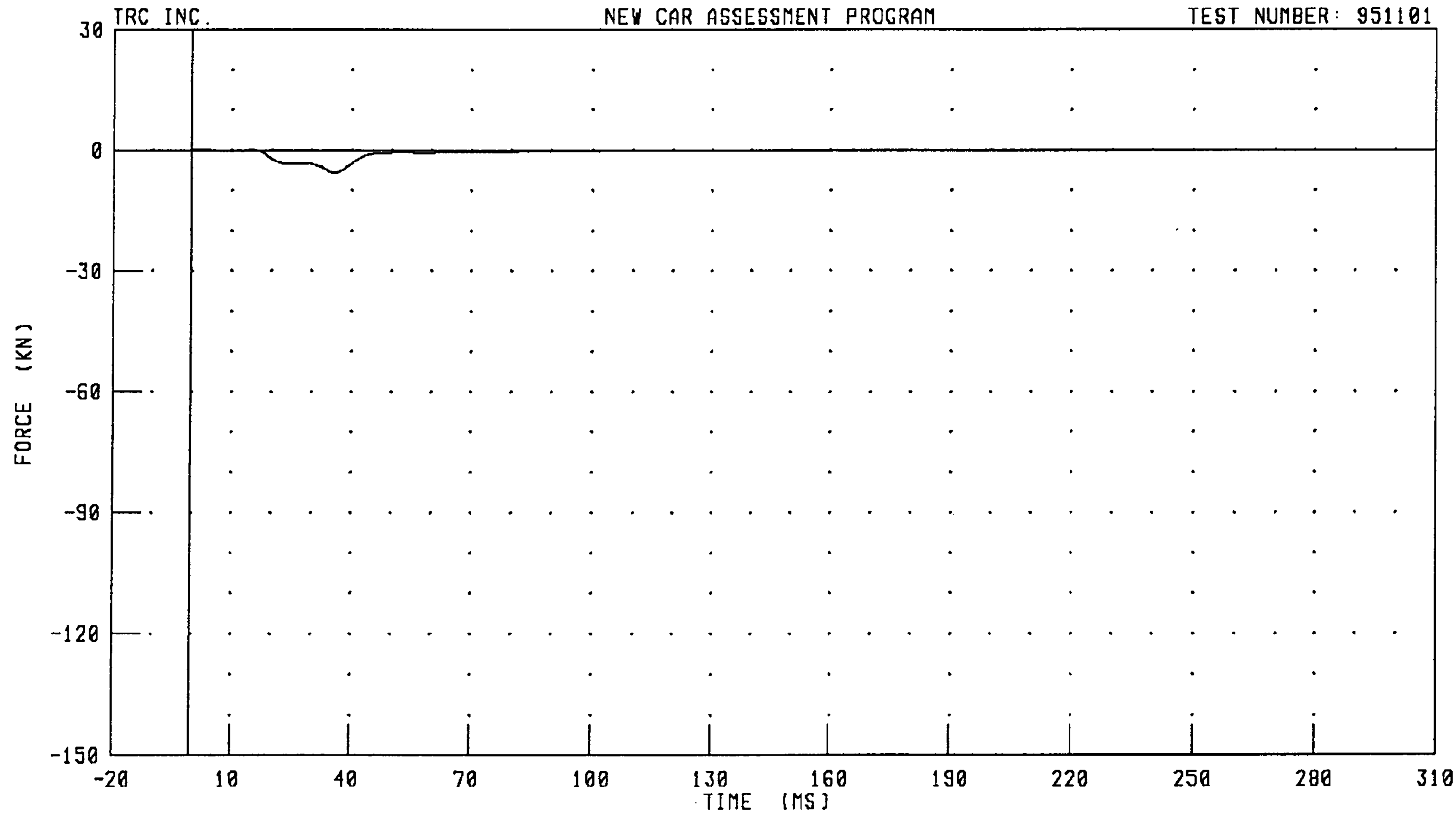
CHANNEL: BB9F FILTER: CH. CLASS 60 PEAK DATA: 0.14 KN @ 10.32 MS; -0.85 KN @ 46.24 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C2 FORCE
NEW CAR ASSESSMENT PROGRAM



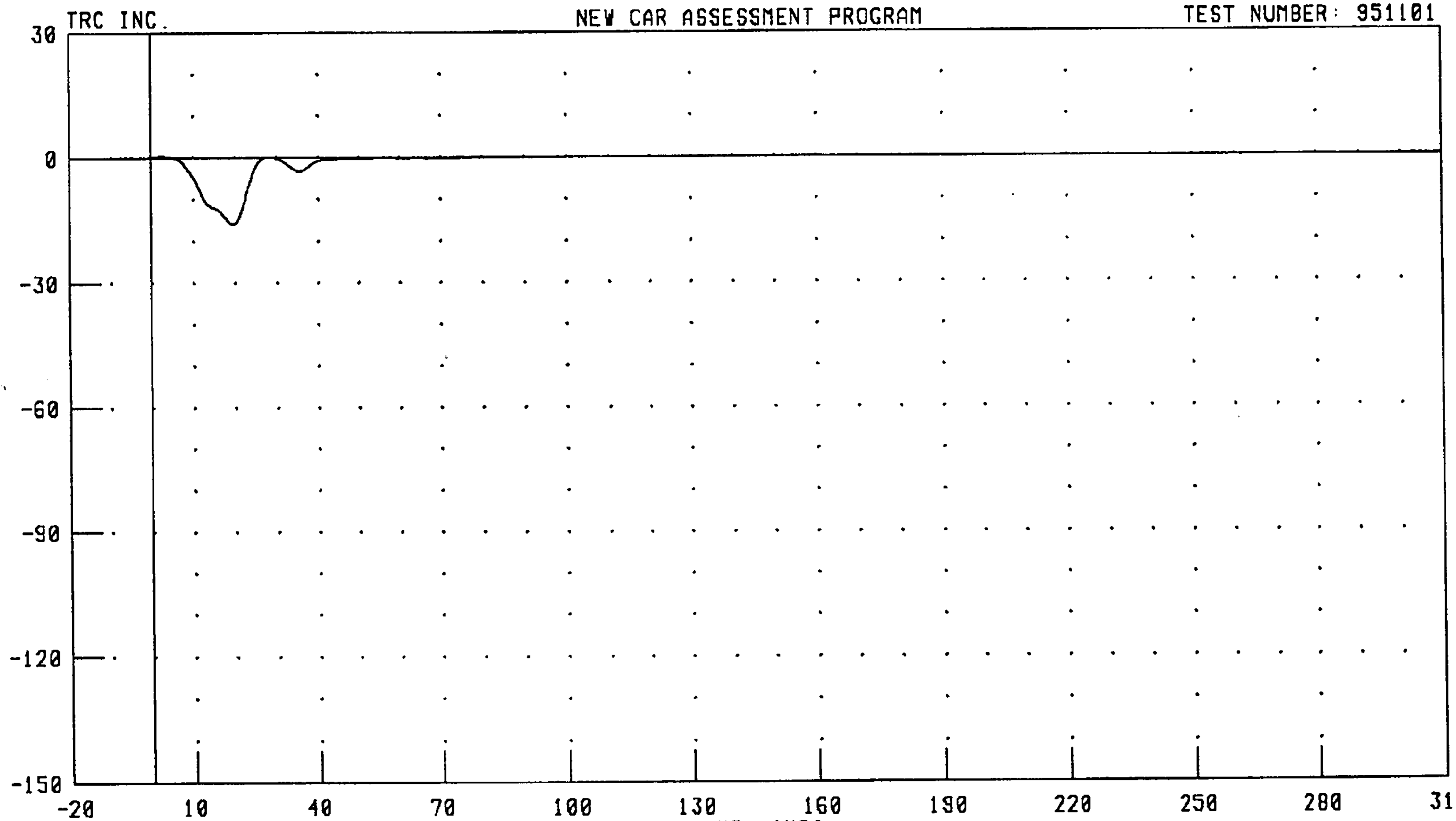
CHANNEL: BC2F FILTER: CH. CLASS 60 PEAK DATA: 0.23 KN @ 2.96 MS; -17.42 KN @ 30.08 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C3 FORCE
NEW CAR ASSESSMENT PROGRAM

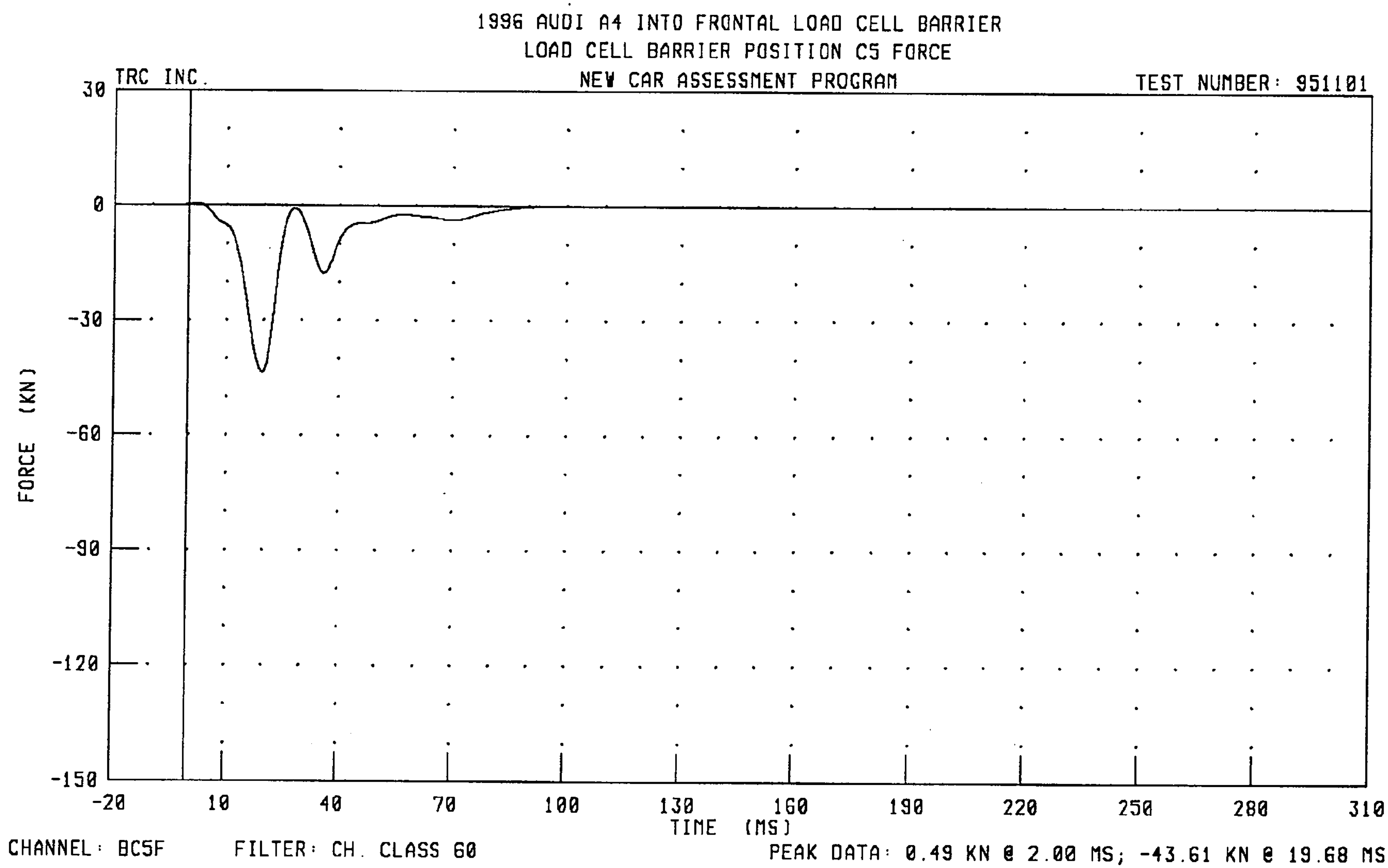


CHANNEL: BC3F FILTER: CH. CLASS 60 PEAK DATA: 0.29 KN @ 2.48 MS; -5.62 KN @ 35.76 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C4 FORCE
NEW CAR ASSESSMENT PROGRAM



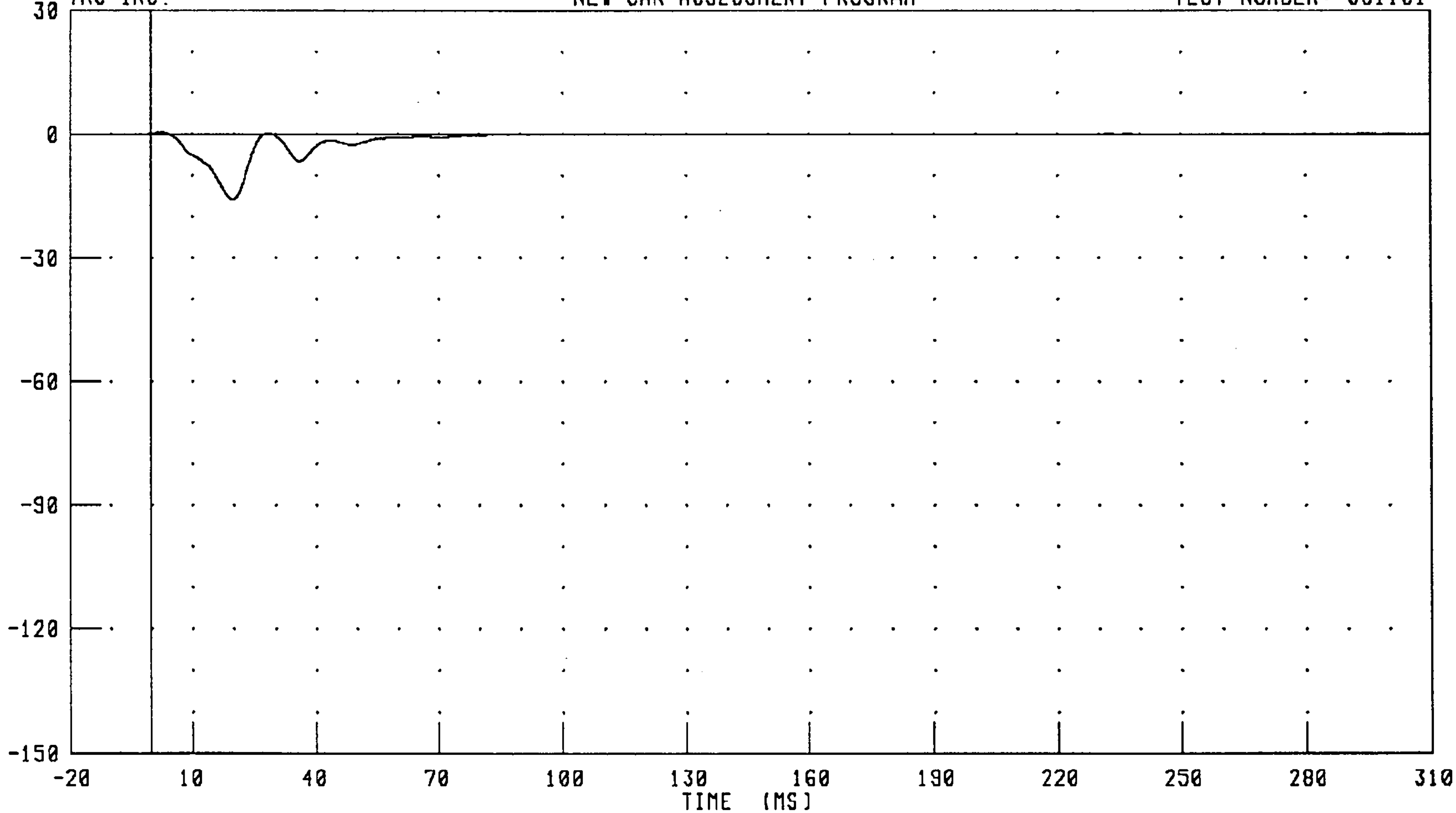
CHANNEL: BC4F FILTER: CH. CLASS 60 PEAK DATA: 0.37 KN @ 2.40 MS; -15.98 KN @ 19.68 MS


1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C5 FORCE
NEW CAR ASSESSMENT PROGRAM
TRC INC.
TEST NUMBER: 951101
FORCE (KN)
30
0
-30
-60
-90
-120
-150
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BC5F
FILTER: CH. CLASS 60
PEAK DATA: 0.49 KN @ 2.00 MS; -43.61 KN @ 19.68 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C6 FORCE
NEW CAR ASSESSMENT PROGRAM

TRC INC.

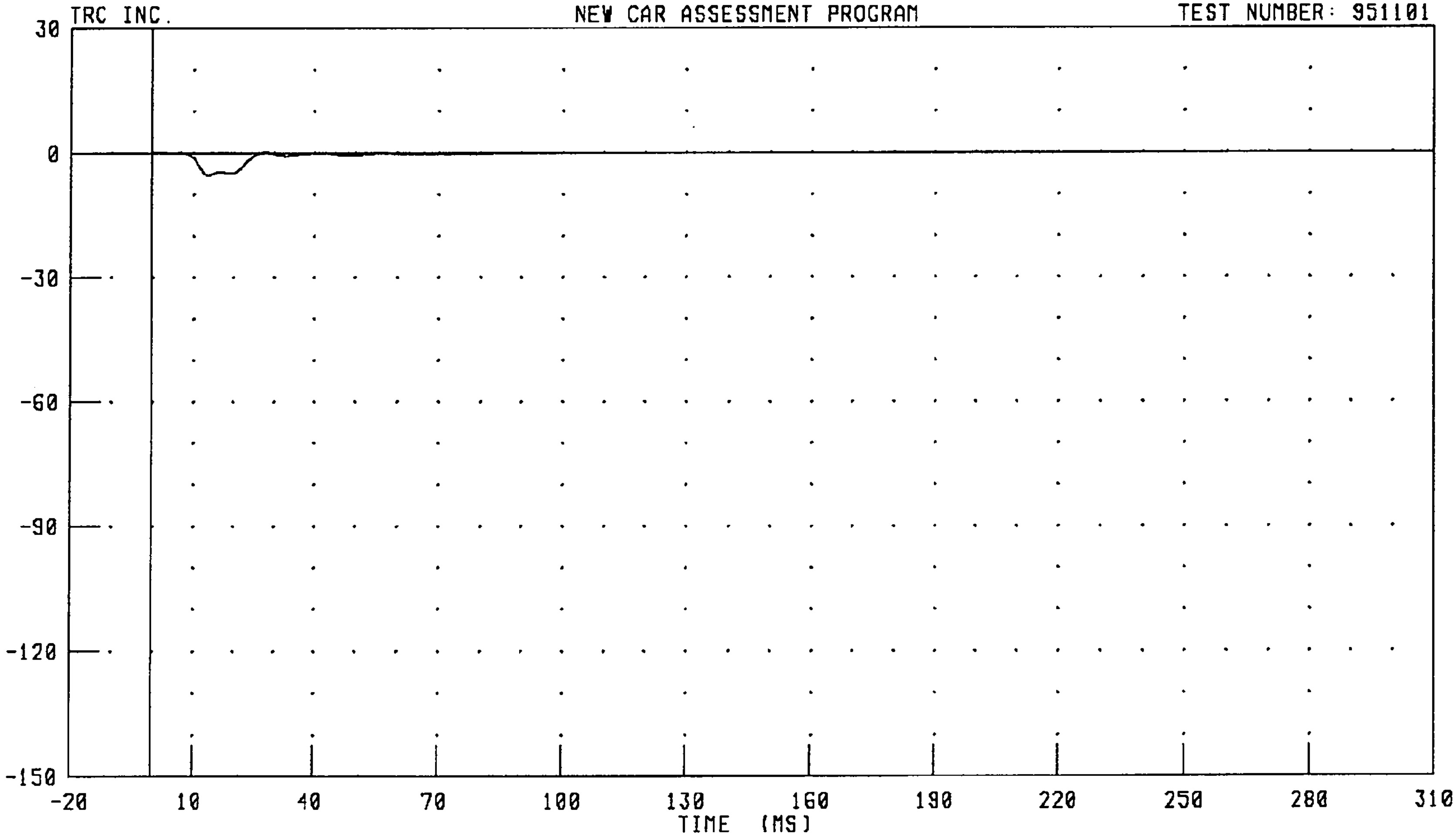
TEST NUMBER: 951101



CHANNEL: BC6F FILTER: CH. CLASS 60 PEAK DATA: 0.42 KN @ 2.24 MS; -15.89 KN @ 19.84 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C7 FORCE
NEW CAR ASSESSMENT PROGRAM

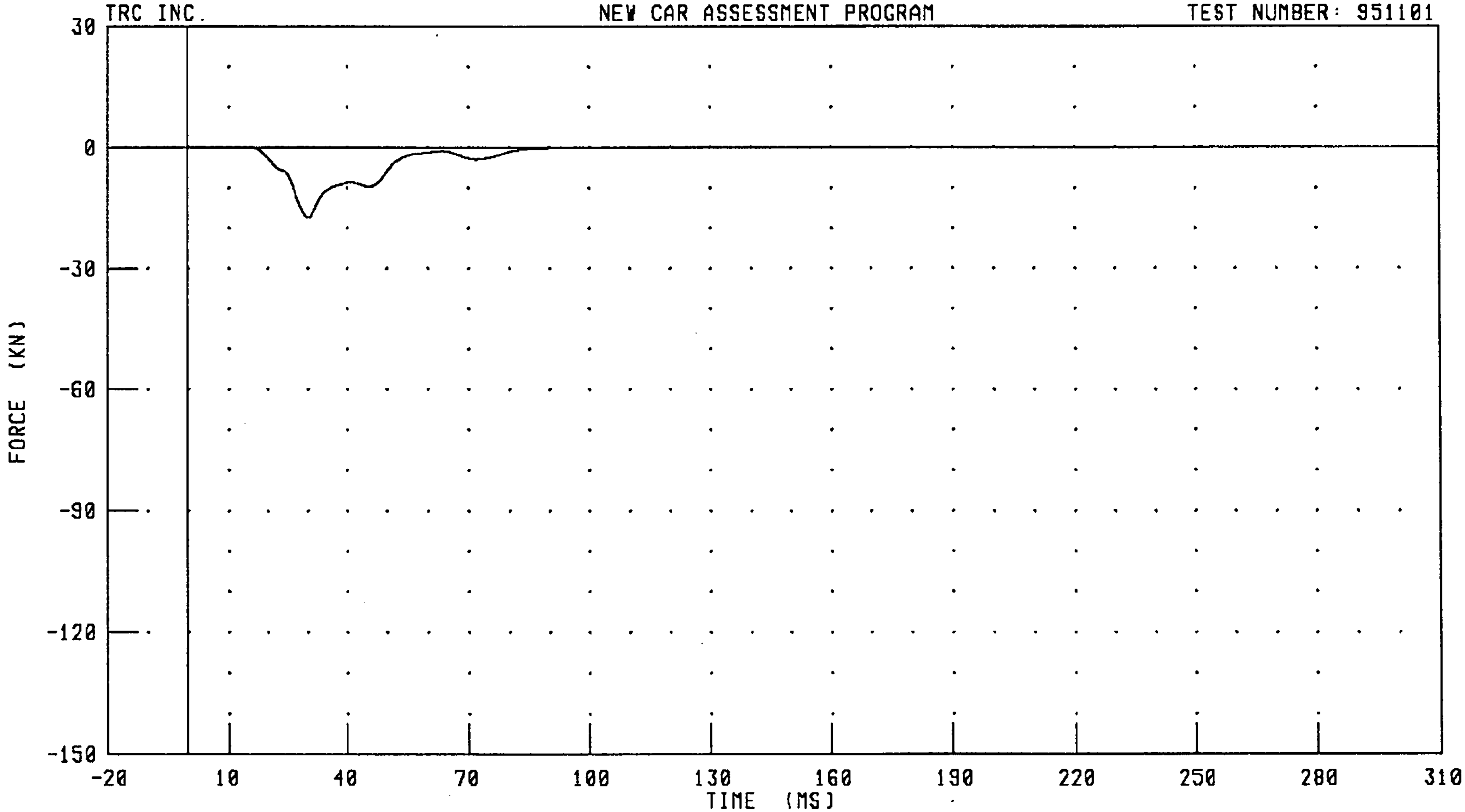
TRC INC. TEST NUMBER: 951101



CHANNEL: BC7F FILTER: CH. CLASS 60 PEAK DATA: 0.13 KN @ 2.08 MS; -5.33 KN @ 13.68 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C8 FORCE
NEW CAR ASSESSMENT PROGRAM

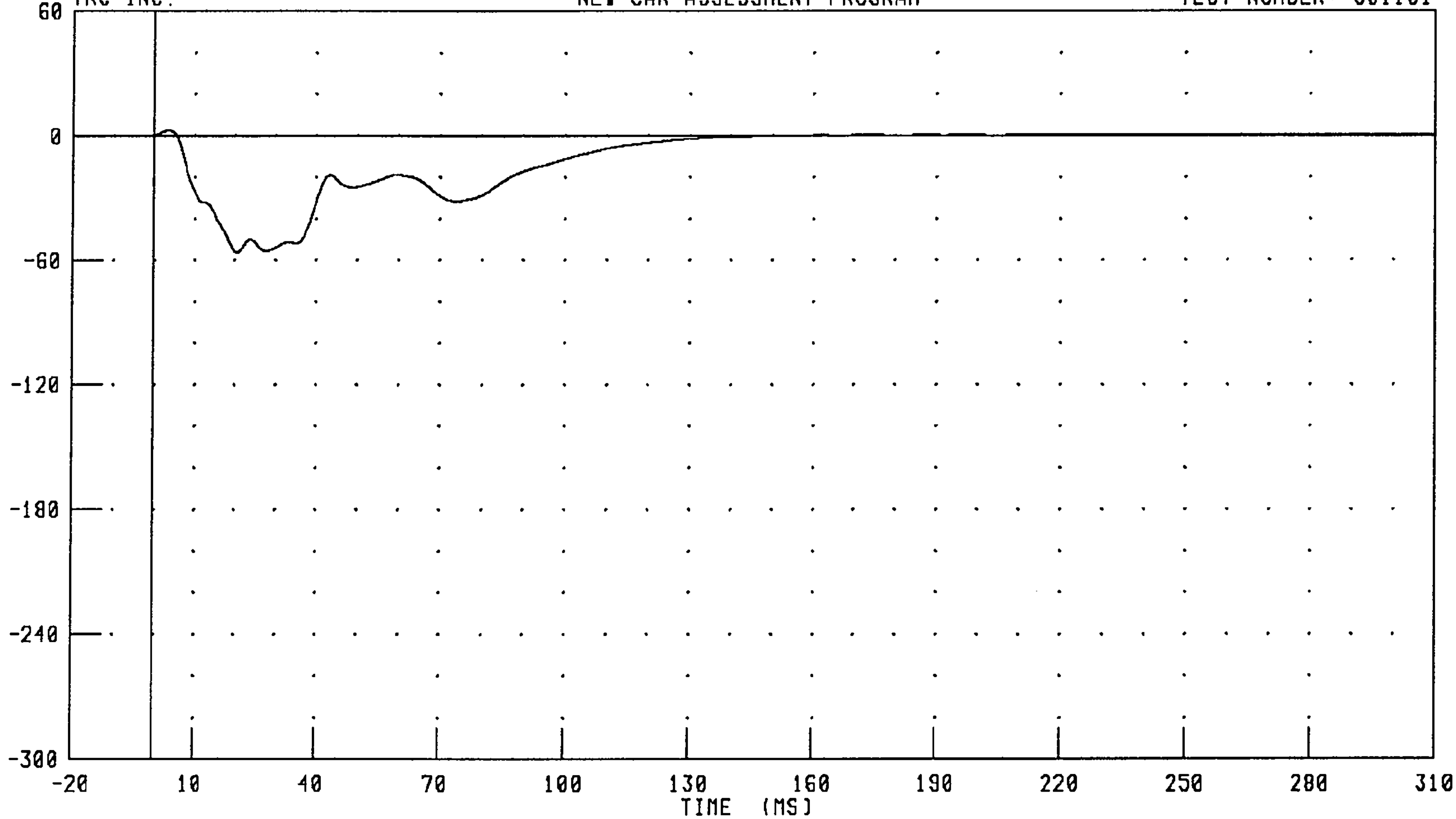
TRC INC. TEST NUMBER: 951101



CHANNEL: BC8F FILTER: CH. CLASS 60 PEAK DATA: 0.07 KN @ 10.96 MS; -17.35 KN @ 30.32 MS

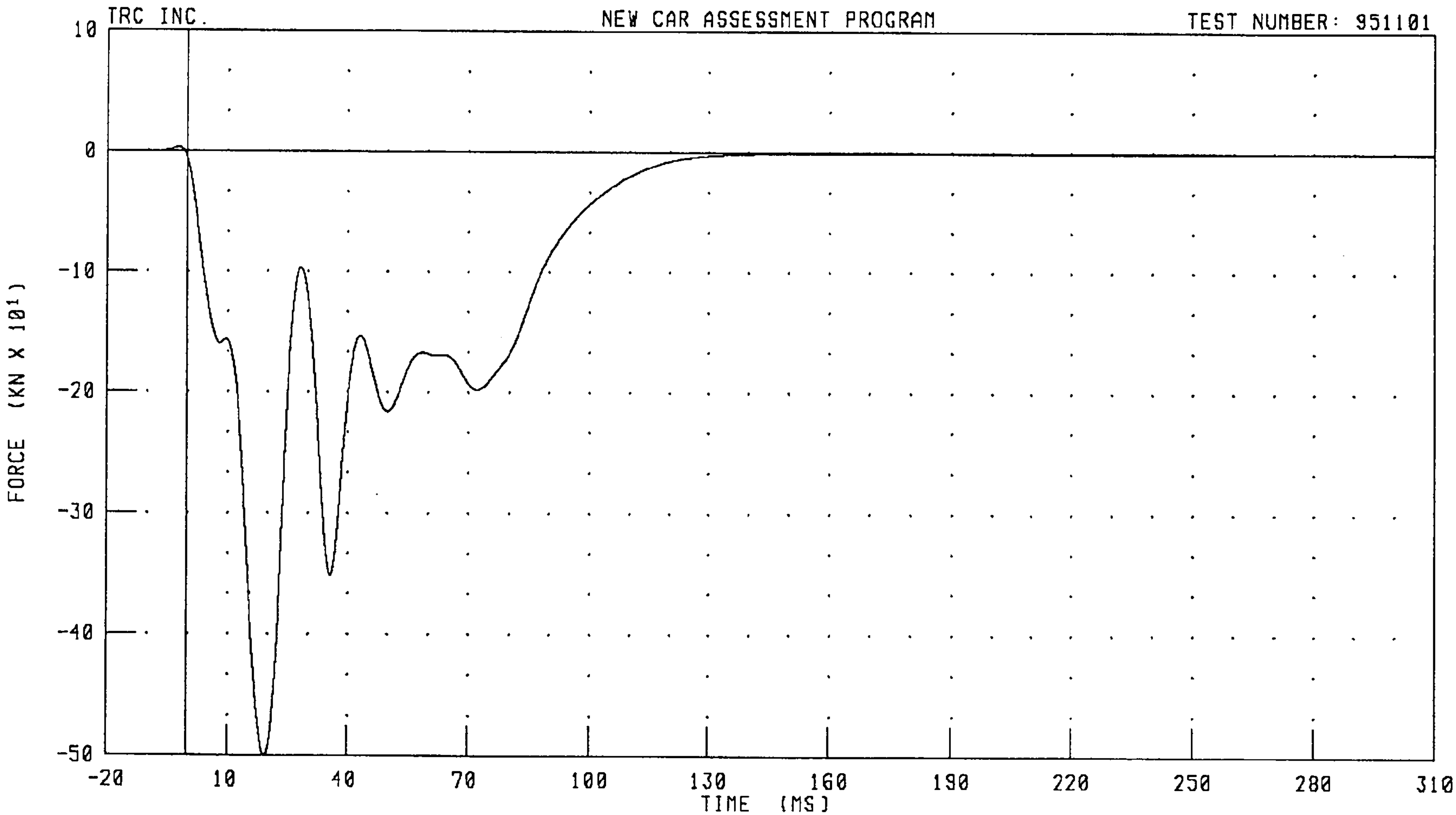
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 1 FORCE TOTAL
NEW CAR ASSESSMENT PROGRAM

TRC INC.   TEST NUMBER: 951101



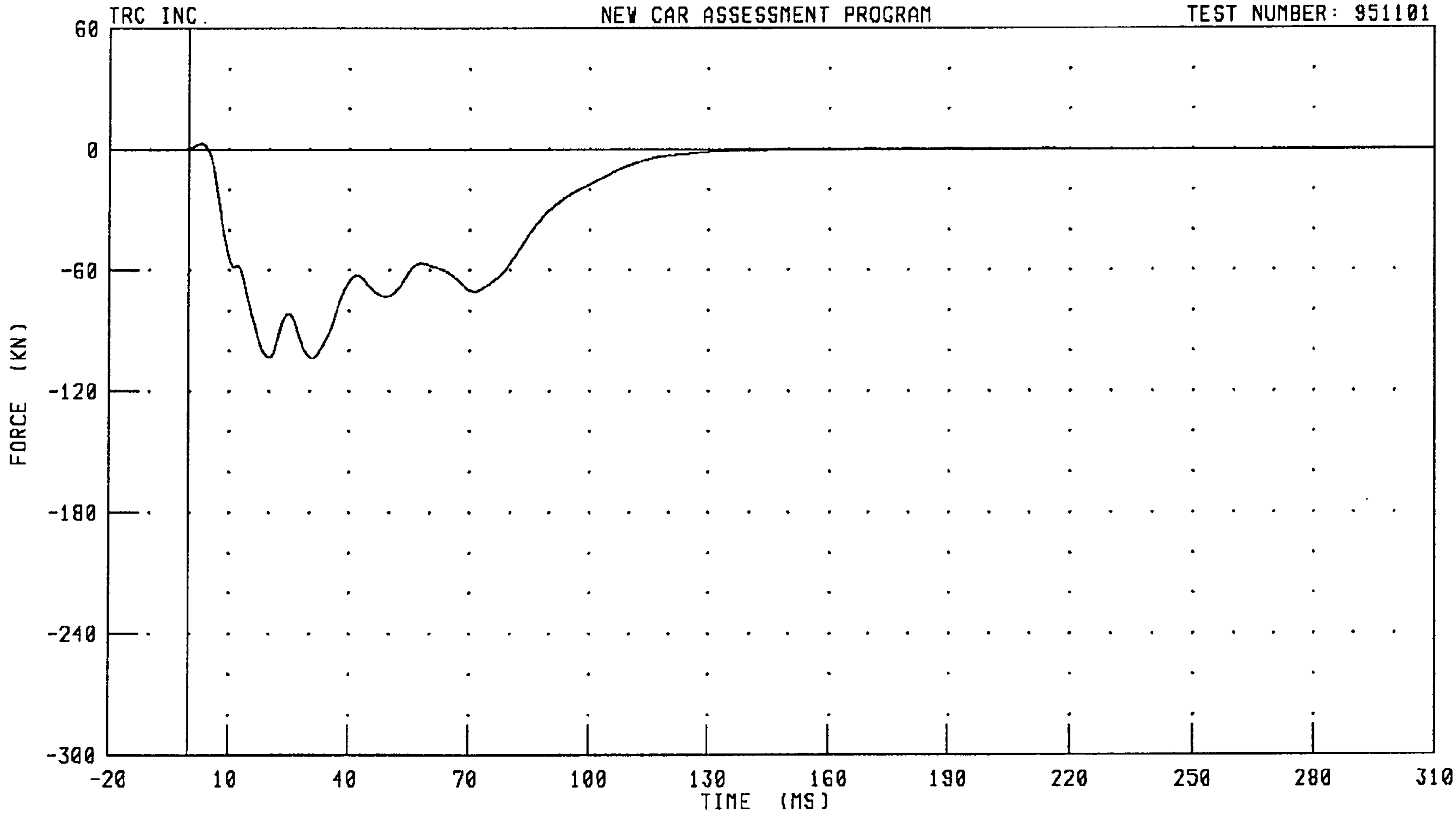
CHANNEL: LCBG1F   FILTER: CH. CLASS 60   PEAK DATA: 2.50 KN @ 3.52 MS; -56.31 KN @ 20.64 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 2 FORCE TOTAL
NEW CAR ASSESSMENT PROGRAM



CHANNEL: LCBG2F FILTER: CH. CLASS 60 PEAK DATA: 3.17 KN @ -2.24 MS; -499.66 KN @ 19.36 MS

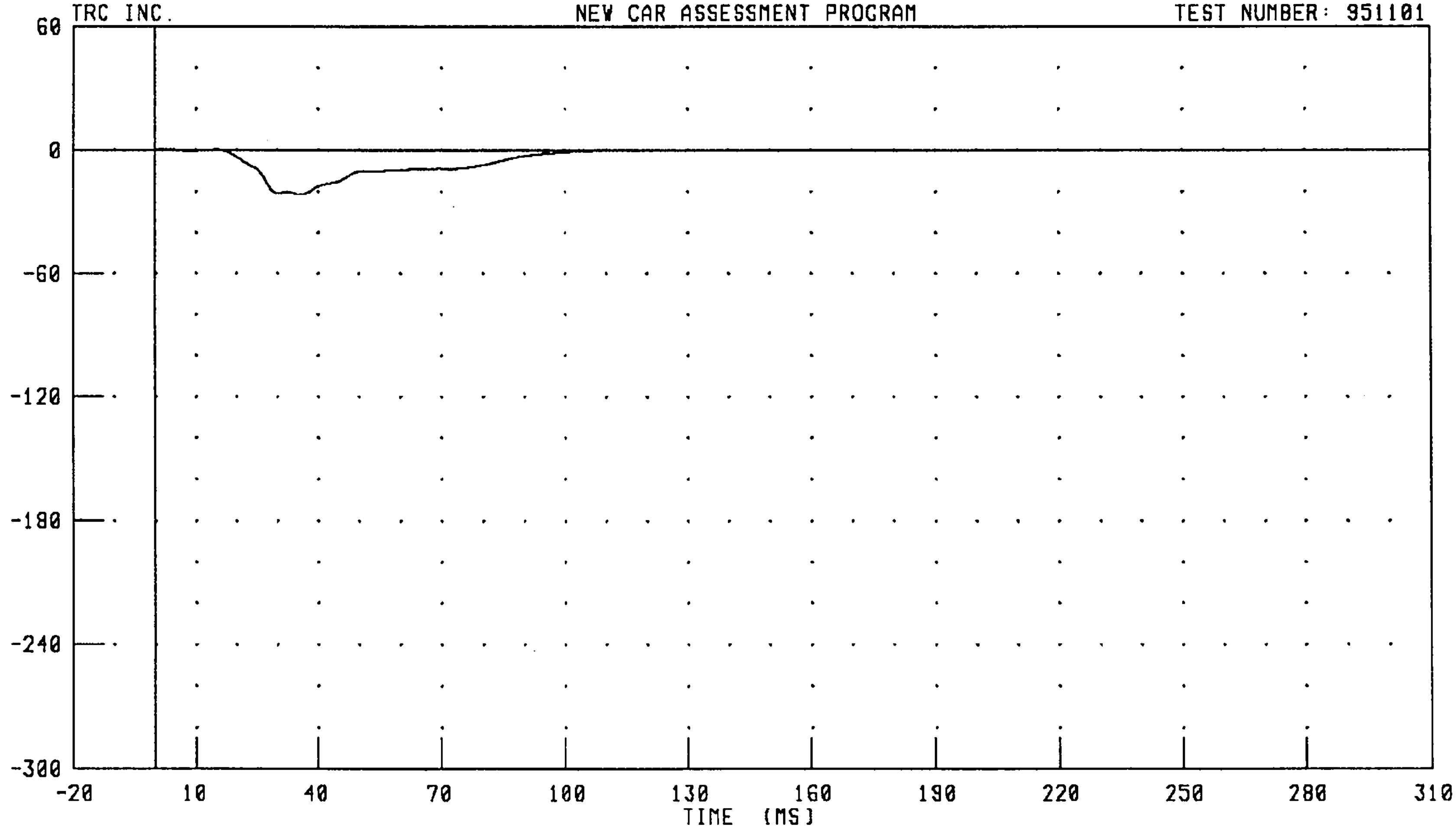
1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 3 FORCE TOTAL
NEW CAR ASSESSMENT PROGRAM



CHANNEL: LCBG3F FILTER: CH. CLASS 60

PEAK DATA: 2.73 KN @ 2.96 MS; -103.62 KN @ 30.80 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 4 FORCE TOTAL
NEW CAR ASSESSMENT PROGRAM

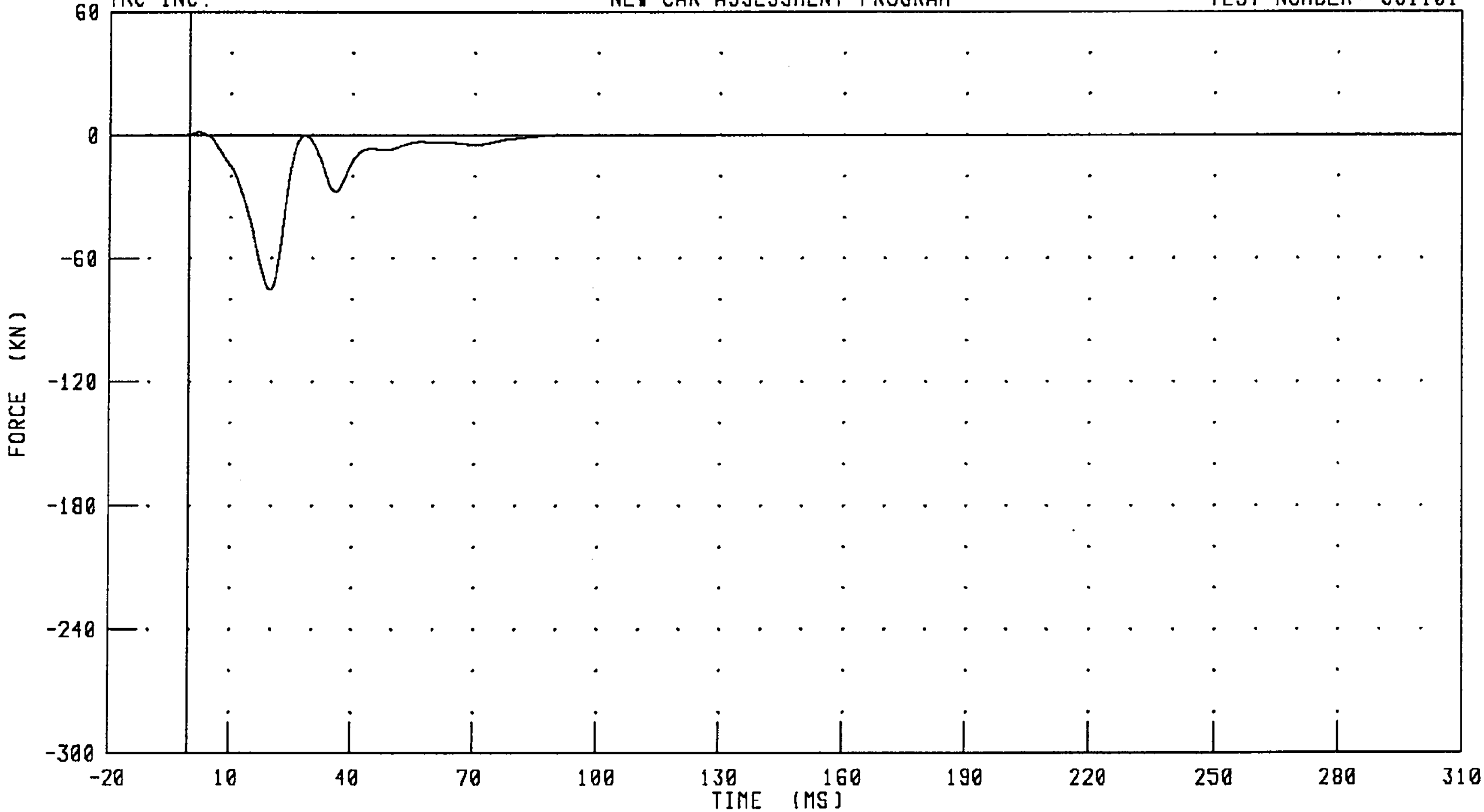


CHANNEL: LCBG4F FILTER: CH. CLASS 60 PEAK DATA: 0.51 KN @ 2.64 MS; -21.62 KN @ 35.76 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 5 FORCE TOTAL
NEW CAR ASSESSMENT PROGRAM

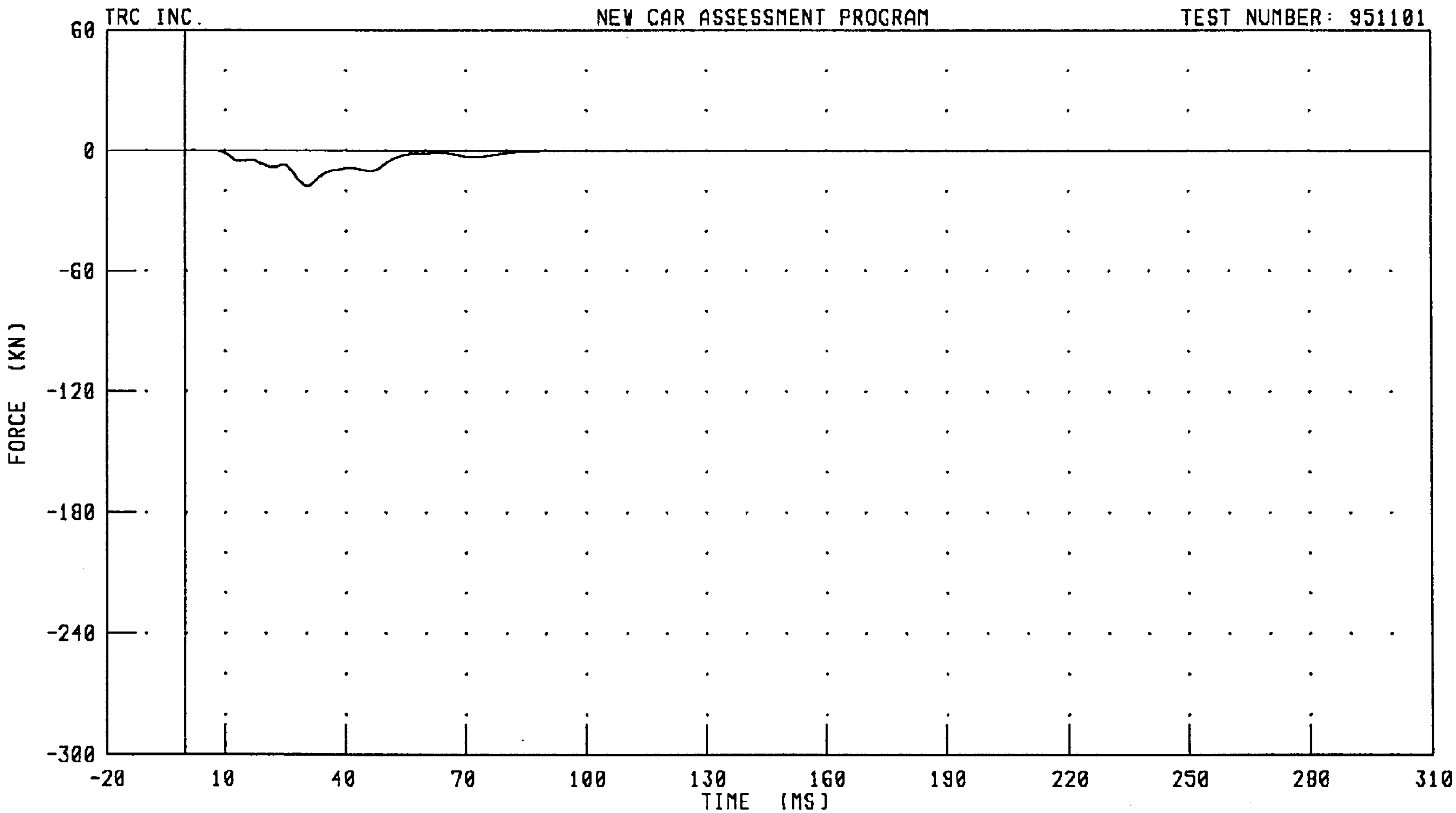
TRC INC.

TEST NUMBER: 951101

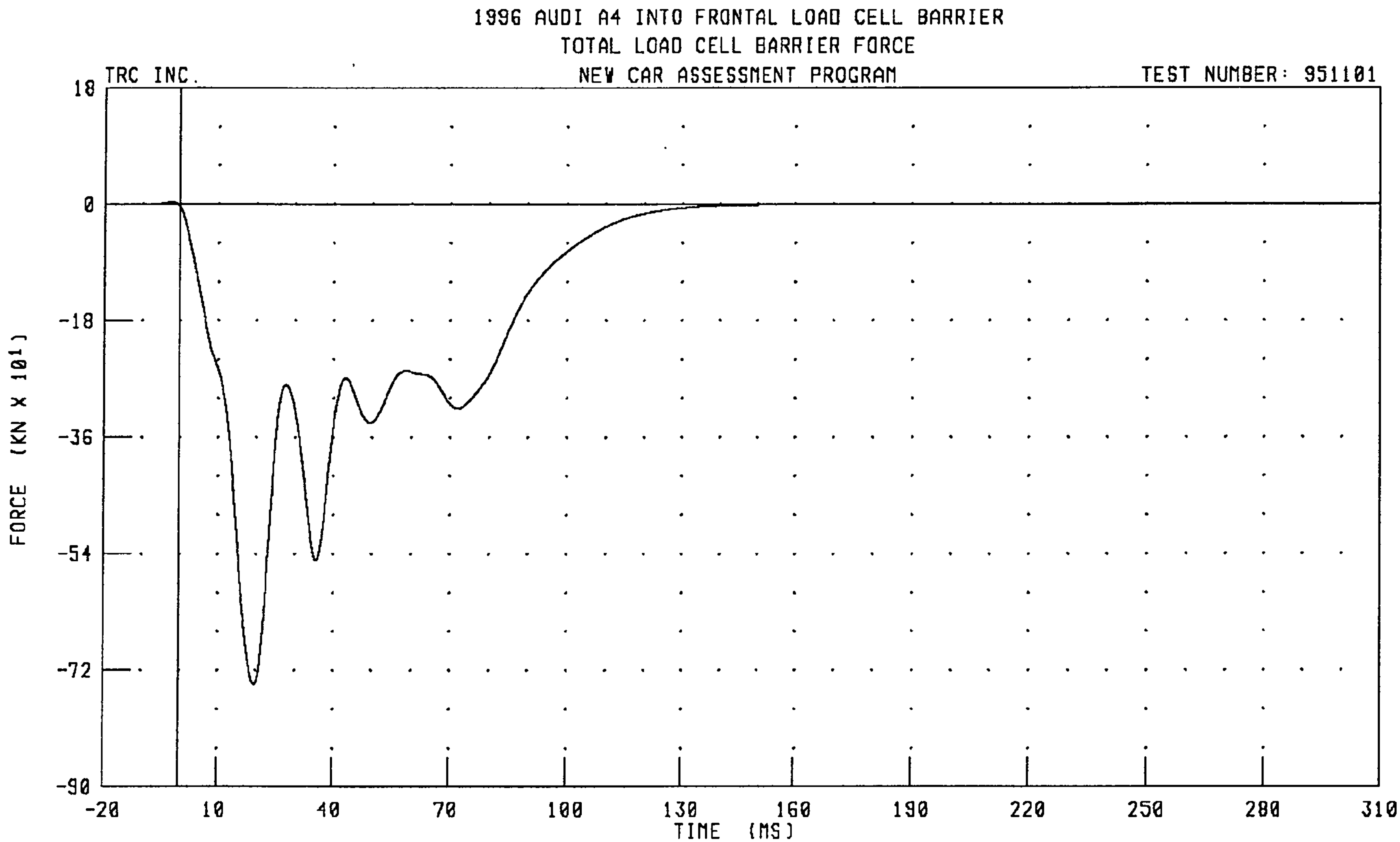


CHANNEL: LCBG5F   FILTER: CH. CLASS 60   PEAK DATA: 1.27 KN @ 2.16 MS; -75.47 KN @ 19.68 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 6 FORCE TOTAL



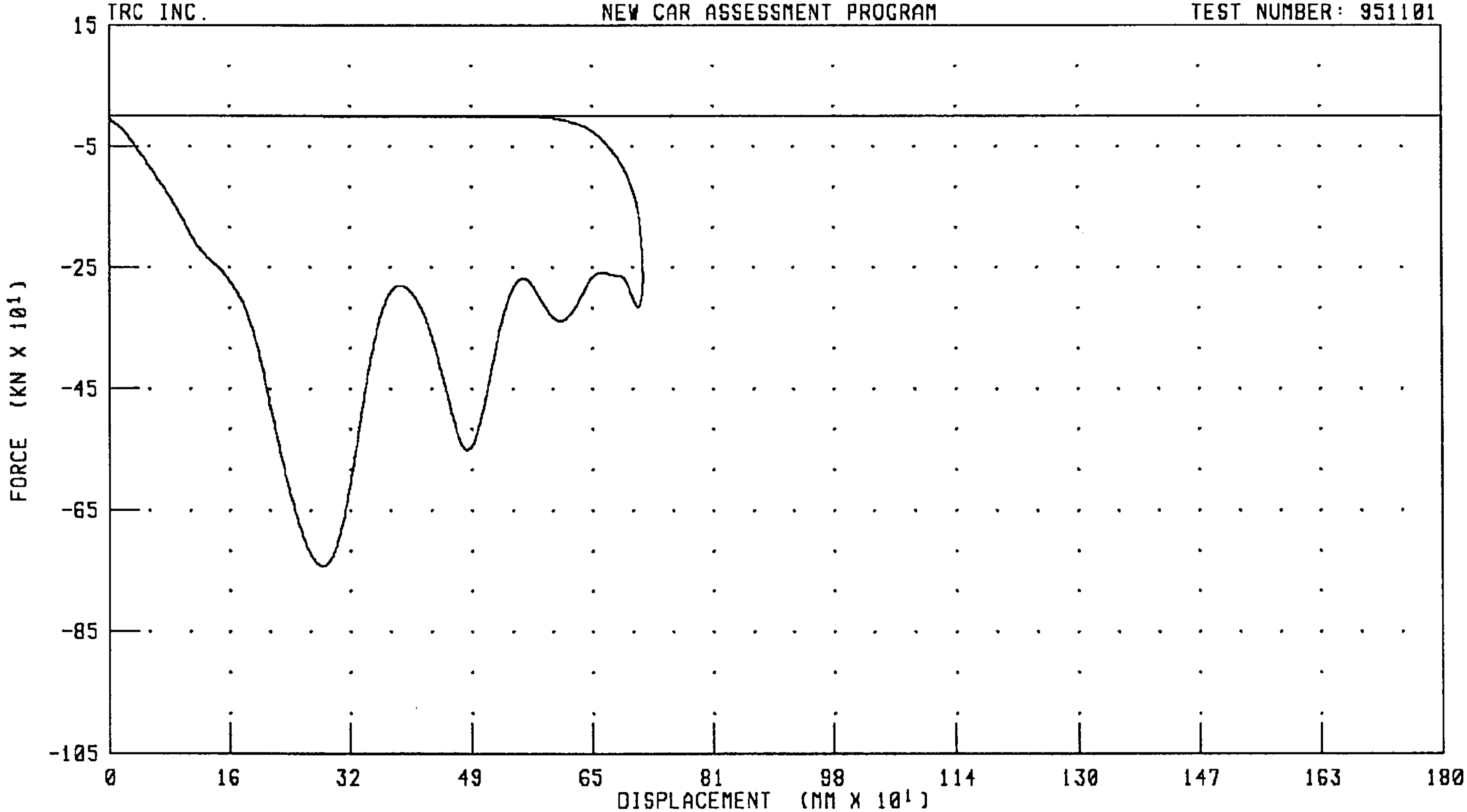
CHANNEL: LCBG6F FILTER: CH. CLASS 60 PEAK DATA: 0.18 KN @ 2.00 MS; -17.71 KN @ 30.48 MS



CHANNEL: LCBGT FILTER: CH. CLASS 60 PEAK DATA: 2.87 KN @ -2.16 MS; -741.98 KN @ 19.68 MS

1996 AUDI A4 INTO FRONTAL LOAD CELL BARRIER
TOTAL LOAD CELL BARRIER FORCE VS AVERAGE VEHICLE X-AXIS DISPLACEMENT

TRC INC. NEW CAR ASSESSMENT PROGRAM TEST NUMBER: 951101



CHANNEL: QTHXD FILTER: CH. CLASS 180 PEAK DATA: 724.51 MM @ 79.92 MS; 0.00 MM @ 0.00 MS
LCBGT CH. CLASS 60 -0.37 KN @ 292.64 MS; -741.98 KN @ 19.68 MS

Appendix C

Dummy Certification Data

Pre-test Certification Data

Driver Dummy S/N: 142

TRANSPORTATION RESEARCH CENTER INC.
HYBRID III EXTERNAL DIMENSIONS
142 HUMANOID 13-SEP-95
TRC INC. TEST NO: 142C28ED1 572E SN142 EXT.DIMENSION CAL28

TEST PARAMETER	(DIMEN.)	SPECIFICATION	TEST RESULTS
LOCATION FOR CHEST CIRCUMFERENCE	(AA)	429 - 434 MM	432. MM
LOCATION FOR WAIST CIRCUMFERENCE	(BB)	226 - 231 MM	229. MM
CHEST CIRCUMFERENCE	(Y)	970 -1001 MM	986. MM
WAIST CIRCUMFERENCE	(Z)	836 - 866 MM	848. MM
CHEST DEPTH	(O)	213 - 229 MM	221. MM
H-POINT HEIGHT	(C)	84 - 89 MM	84. MM
H-POINT FROM SEATBACK	(D)	135 - 140 MM	137. MM
SKULL CAP TO BACKLINE	(H)	41 - 46 MM	43. MM
TOTAL SITTING HEIGHT	(A)	879 - 889 MM	879. MM
THIGH CLEARANCE	(F)	140 - 155 MM	145. MM
BUTTOCK KNEE LENGTH	(K)	579 - 605 MM	602. MM
BUTTOCK POPLITEAL LENGTH	(N)	452 - 478 MM	470. MM
POPLITEAL HEIGHT	(L)	429 - 455 MM	445. MM
KNEE PIVOT HEIGHT	(M)	485 - 500 MM	488. MM
FOOT LENGTH	(P)	252 - 267 MM	257. MM
FOOT BREADTH	(W)	91 - 107 MM	97. MM
SHOULDER PIVOT FROM BACKLINE	(E)	84 - 94 MM	91. MM
SHOULDER BREADTH	(V)	422 - 437 MM	429. MM
SHOULDER PIVOT HEIGHT	(B)	506 - 521 MM	508. MM
ELBOW REST HEIGHT	(J)	191 - 211 MM	203. MM
SHOULDER-ELBOW LENGTH	(I)	330 - 345 MM	345. MM
BACK OF ELBOW TO WRIST PIVOT	(G)	290 - 305 MM	292. MM

DUMMY MEETS SPECIFICATIONS
TECHNICIAN Charles Middle

RUN NUMBER: 092595.0953

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

HYBRID III 09-SEP-95

TRC INC. TEST NO: 142C28HD12 572E SN142 HEAD DROP CAL 28

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	64.0 %
PEAK RESULTANT ACCELERATION	225 - 275 G	258.60 G
PEAK LATERAL ACCELERATION	15 G MAX	-3.10 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

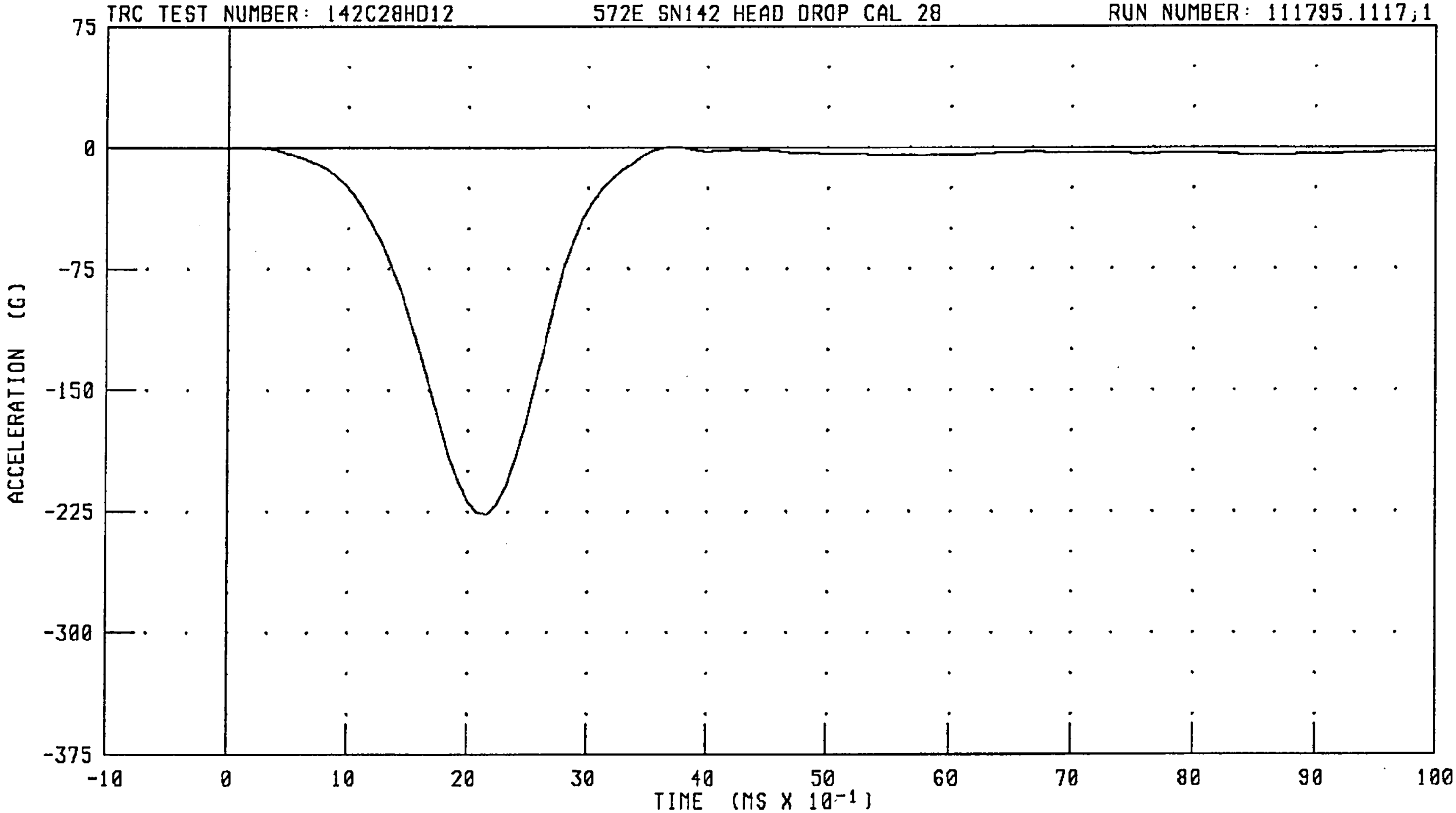
REDUNDANT ACCELEROMETER MOUNT WITH 6 ACCELS.

TEST MEETS SPECIFICATIONS

TECHNICIAN Clar Middlt RUN NUMBER: 090995.1357;1

PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION X AXIS

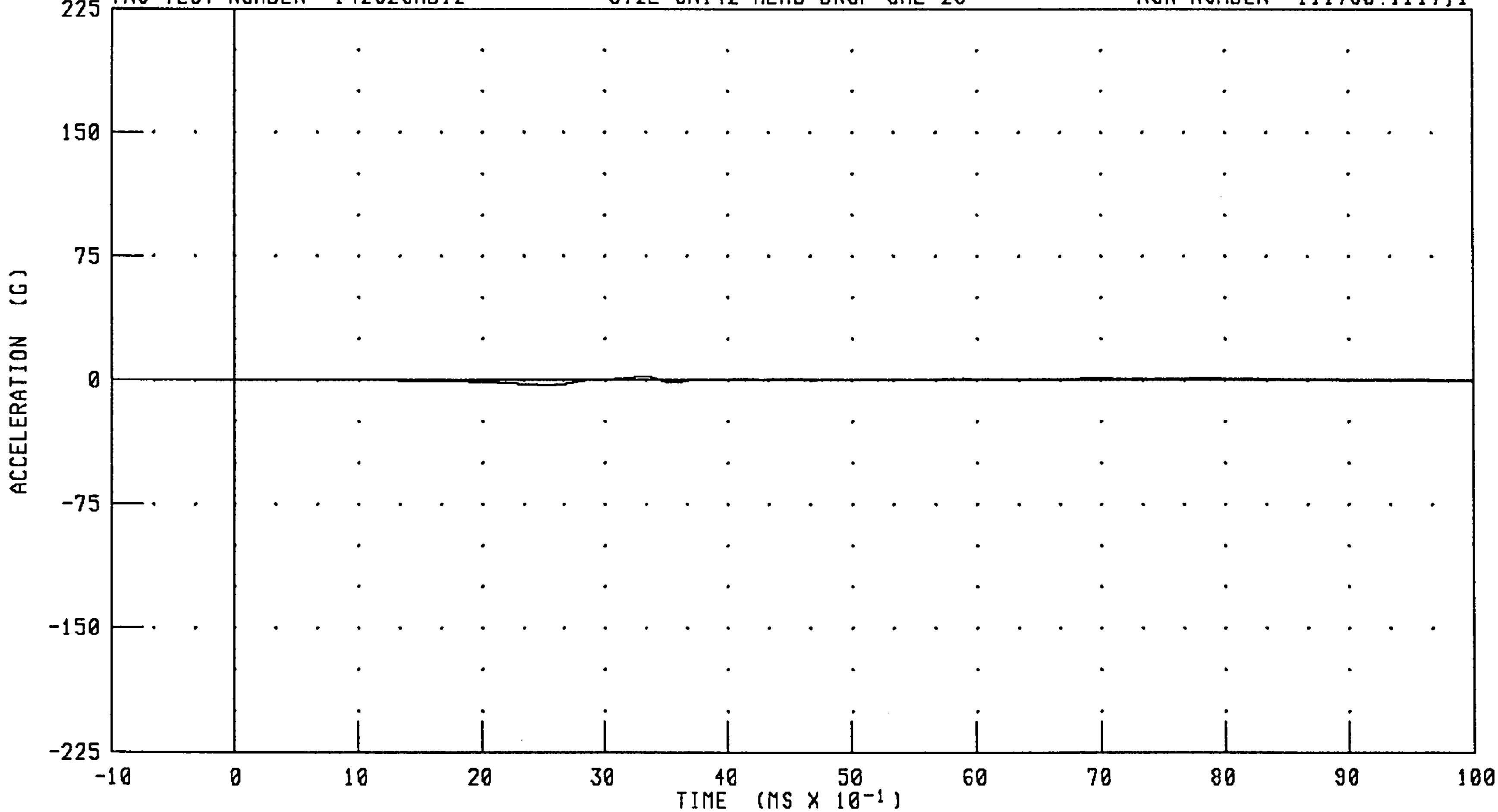
TRC TEST NUMBER: 142C28HD12   572E SN142 HEAD DROP CAL 28   RUN NUMBER: 111795.1117;1



CHANNEL: HEDXG   FILTER: CH. CLASS 1000   PEAK DATA: 0.36 G @ 3.68 MS; -226.52 G @ 2.16 MS

PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION Y AXIS

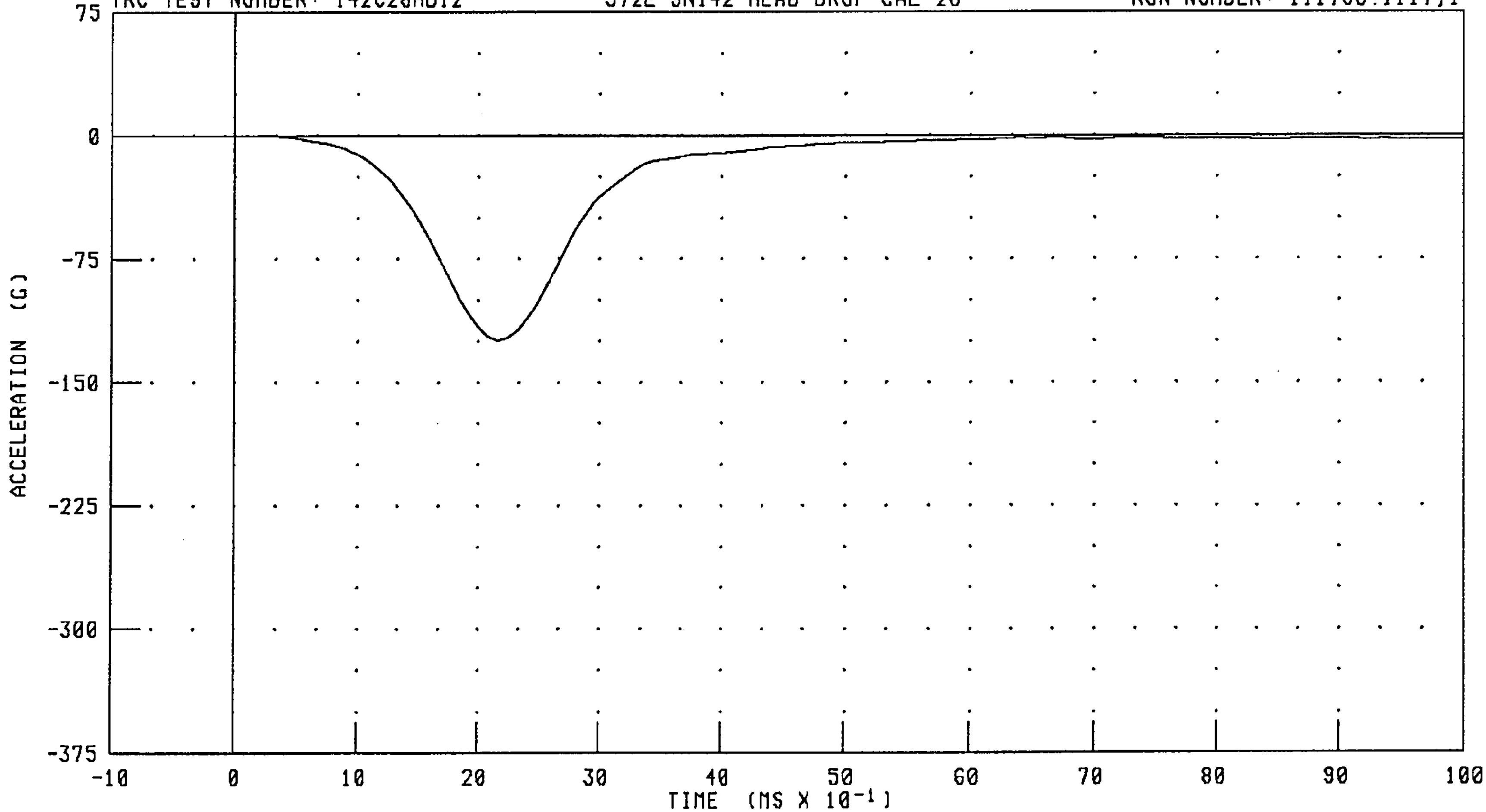
TRC TEST NUMBER: 142C28HD12 572E SN142 HEAD DROP CAL 28 RUN NUMBER: 111795.1117;1



CHANNEL: HEDYG FILTER: CH. CLASS 1000 PEAK DATA: 2.09 G @ 3.28 MS; -3.11 G @ 2.48 MS

PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION Z AXIS

TRC TEST NUMBER: 142C28HD12 572E SN142 HEAD DROP CAL 28 RUN NUMBER: 111795.1117;1

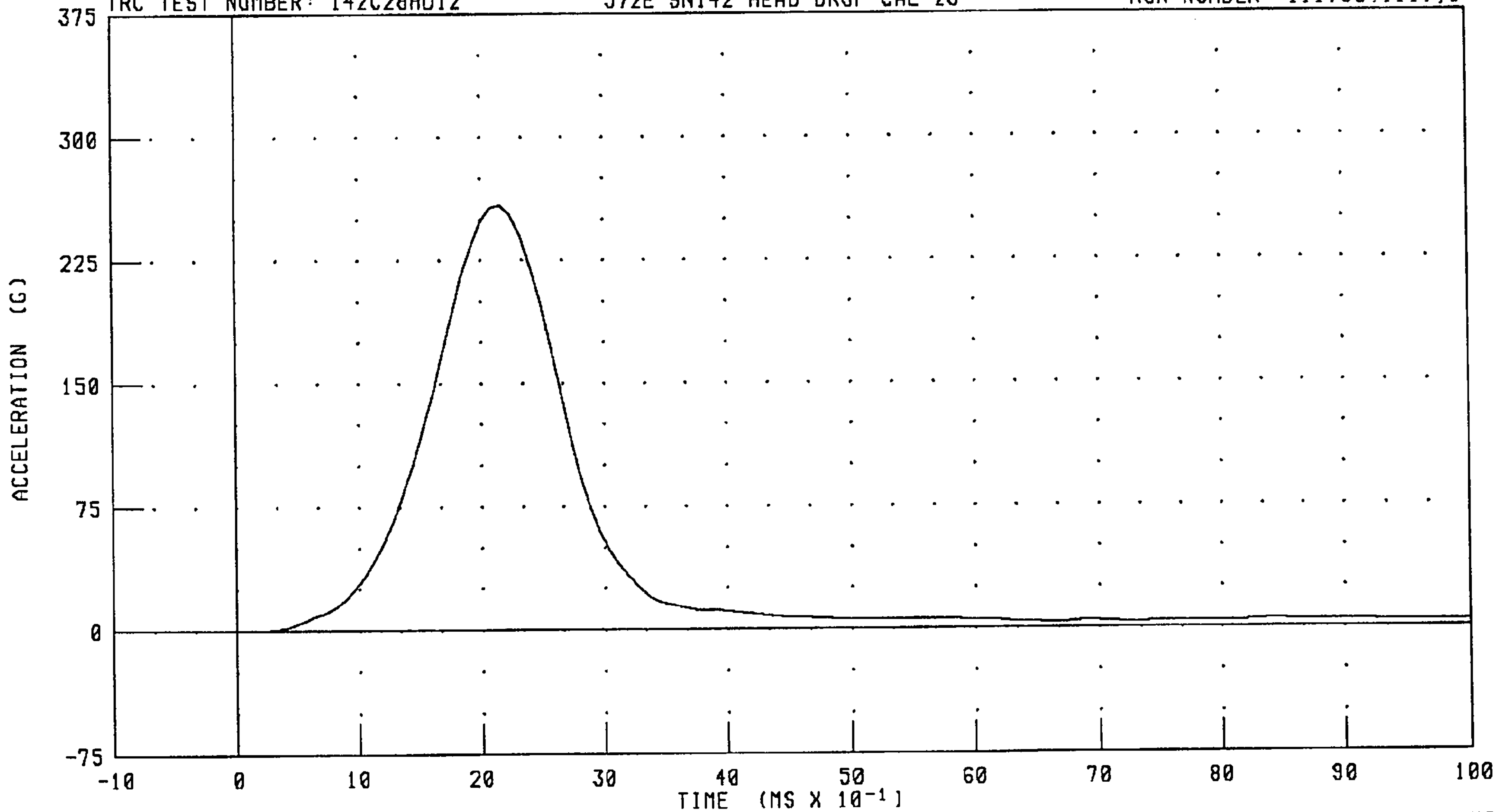


CHANNEL: HEDZG FILTER: CH. CLASS 1000 PEAK DATA: 0.01 G @ 0.08 MS; -124.73 G @ 2.16 MS

PART 572-E HYBRID III HEAD CALIBRATION
HEAD RESULTANT ACCELERATION
572E SN142 HEAD DROP CAL 28

TRC TEST NUMBER: 142C28HD12

RUN NUMBER: 111795.1117;1



CHANNEL: HEDRG FILTER: CH. CLASS 1000 PEAK DATA: 258.60 G @ 2.16 MS; 0.01 G @ 0.00 MS

951101

TRANSPORTATION RESEARCH CENTER INC.

NECK FLEXION TEST - 6 CHANNEL TRANSDUCER

HYBRID III 13-SEP-95

TRC INC. TEST NO: 142C28NF1 572E SN142 NECK FLEXION CAL28

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6-22.2 DEG. C	20.6 DEG. C
RELATIVE HUMIDITY		10 - 70 %	62.0 %
IMPACT VELOCITY		6.89 - 7.13 M/S	7.06 M/S
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G	22.89 G
	20 MS	17.60 - 22.60 G	20.54 G
	30 MS	12.50 - 18.50 G	17.11 G
MAX PENDULUM G		29 G MAX	23.48 G
MAX PENDULUM G ABOVE 30 MS		29 G MAX	17.10 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		34 - 42 MS	36.00 MS
D PLANE ROTATION	MAX	64 - 78 DEG.	73.47 DEG.
	TIME	57 - 64 MS	58.16 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88.2 - 108.5 NM	99.96 NM
	TIME	47 - 58 MS	49.68 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	114.32 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	101.68 MS

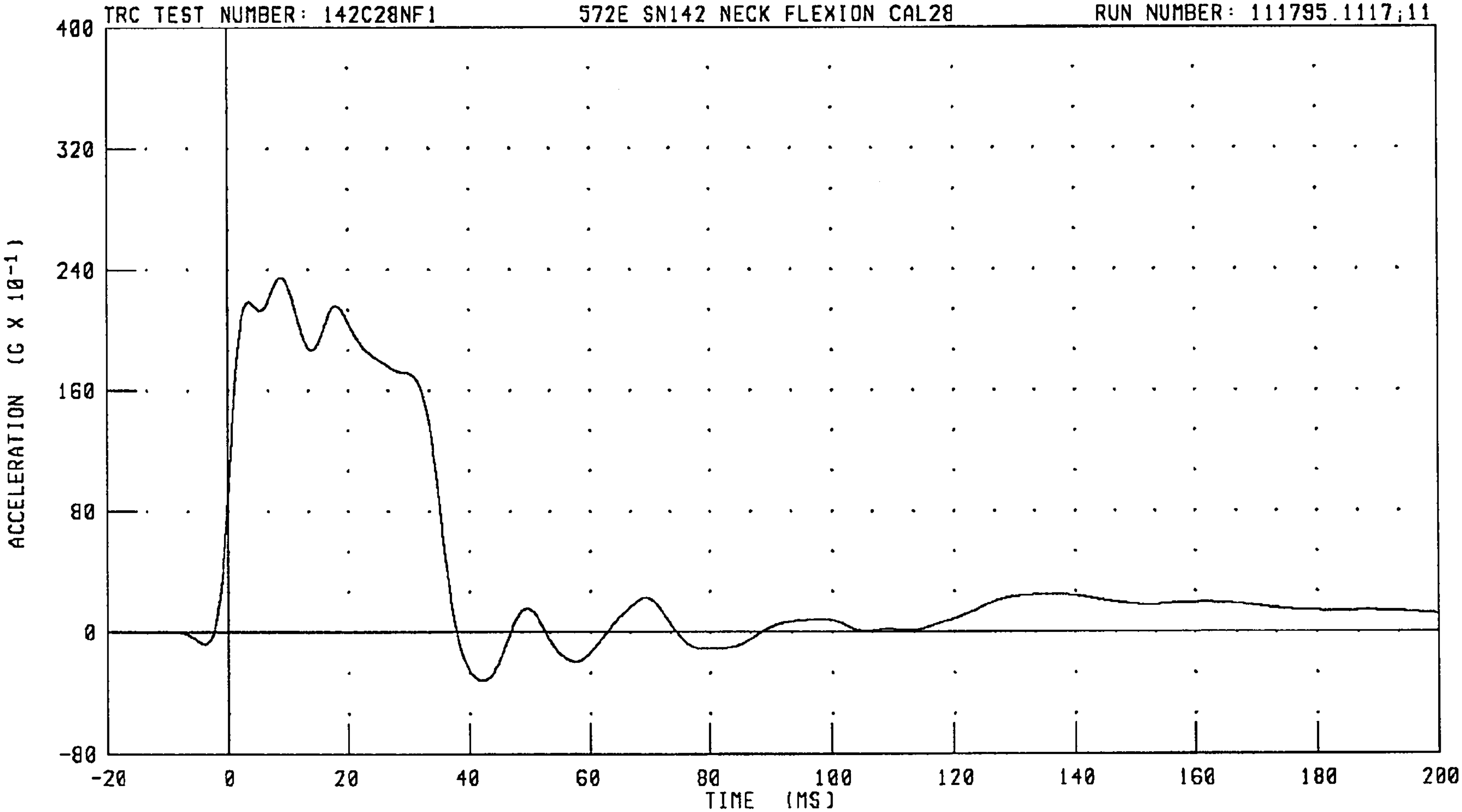
TEST MEETS SPECIFICATIONS

TECHNICIAN Chas. Middle

RUN NUMBER: 091495.1504;11

PART 572-E HYBRID III NECK FLEXION CALIBRATION
PENDULUM DECELERATION

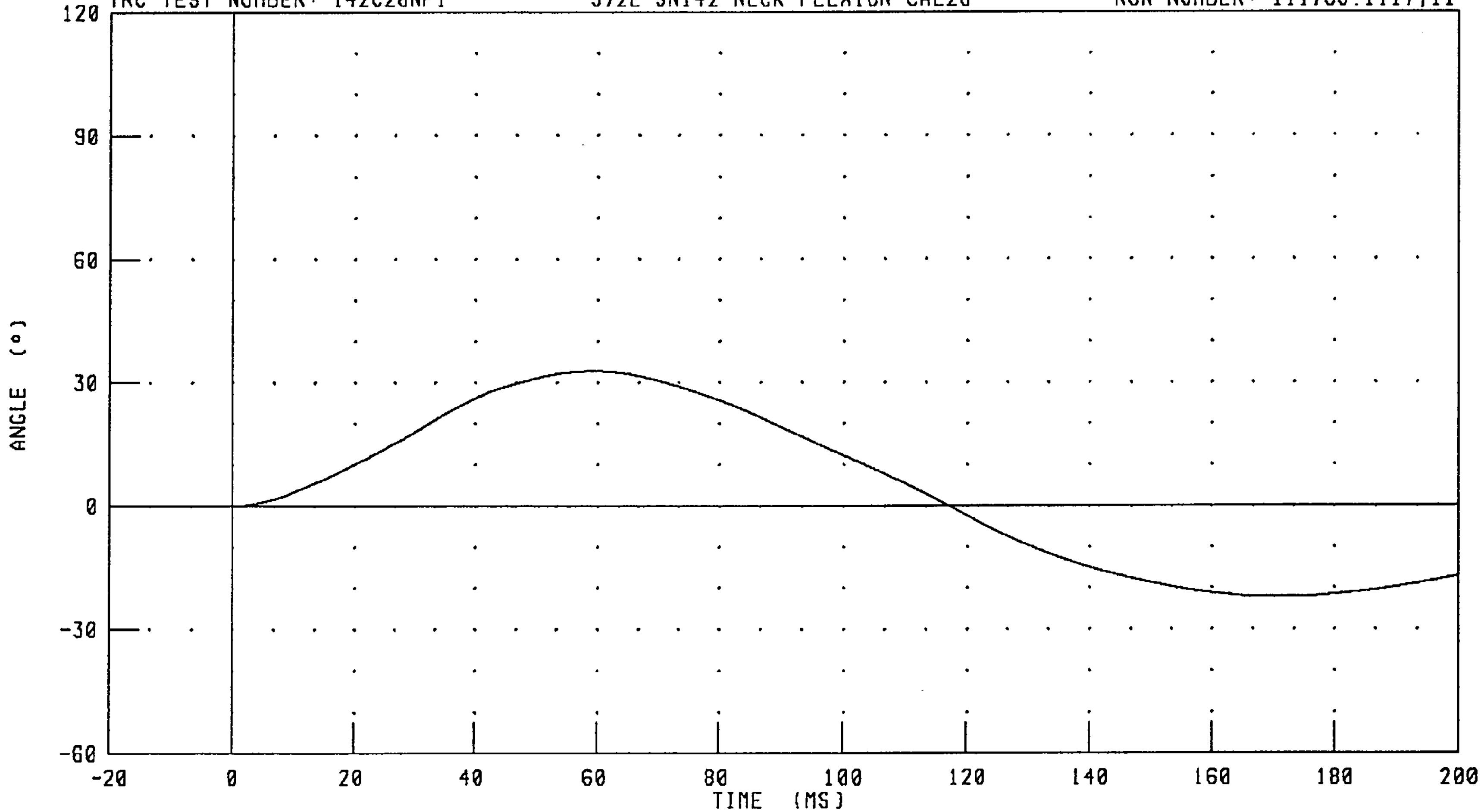
TRC TEST NUMBER: 142C28NF1 572E SN142 NECK FLEXION CAL28 RUN NUMBER: 111795.1117;11



CHANNEL: PENXG FILTER: CH. CLASS 60 PEAK DATA: 23.49 G @ 8.88 MS; -3.19 G @ 42.24 MS

PART 572-E HYBRID III NECK FLEXION CALIBRATION
ROTATION ABOUT BASE OF NECK

TRC TEST NUMBER: 142C28NF1 572E SN142 NECK FLEXION CAL28 RUN NUMBER: 111795.1117;11

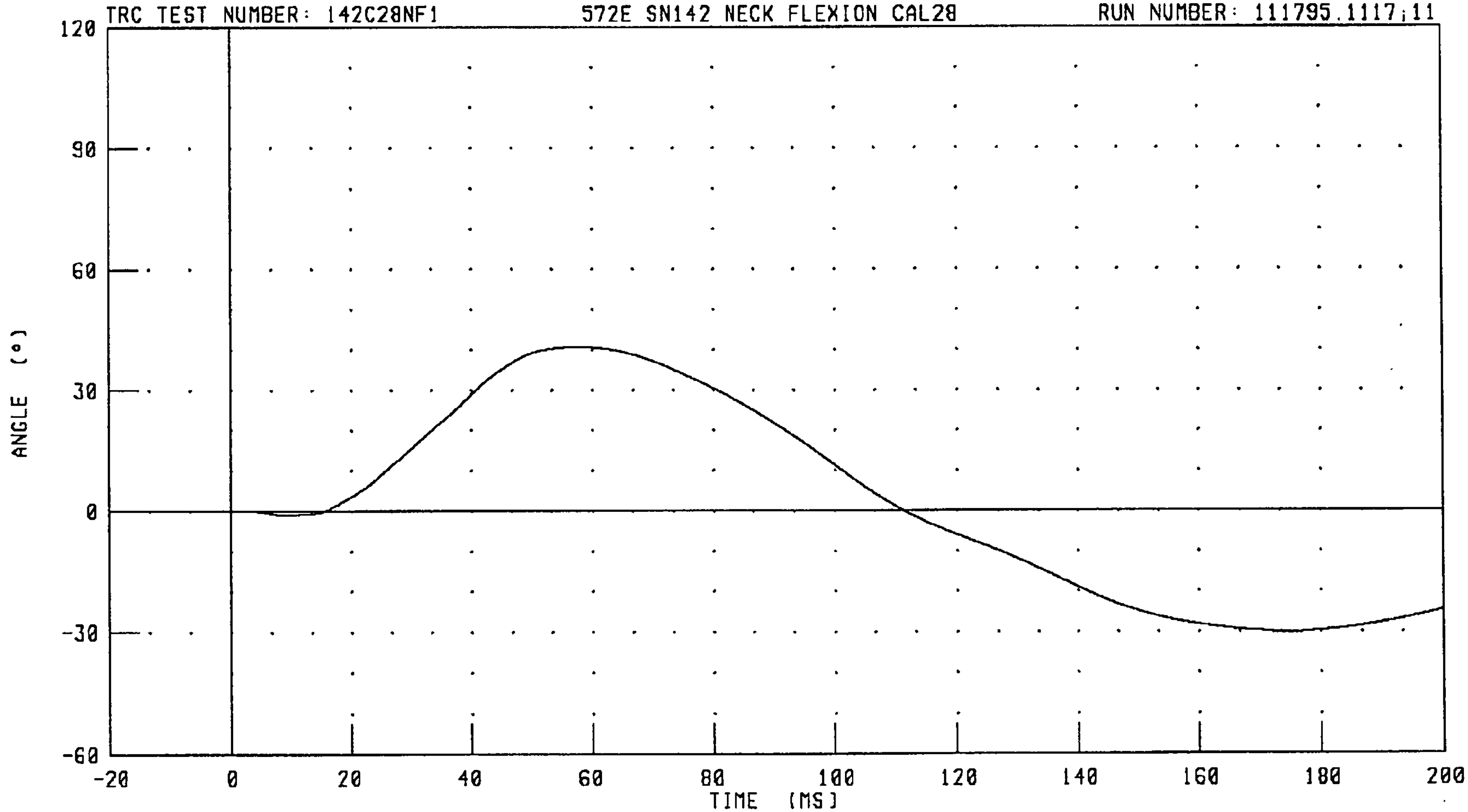


CHANNEL: BETA FILTER: CH. CLASS 60 PEAK DATA: 32.73 ° @ 59.28 MS; -22.06 ° @ 167.92 MS

951101

PART 572-E HYBRID III NECK FLEXION CALIBRATION
ROTATION ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER: 142C28NF1 572E SN142 NECK FLEXION CAL28 RUN NUMBER: 111795.1117;11



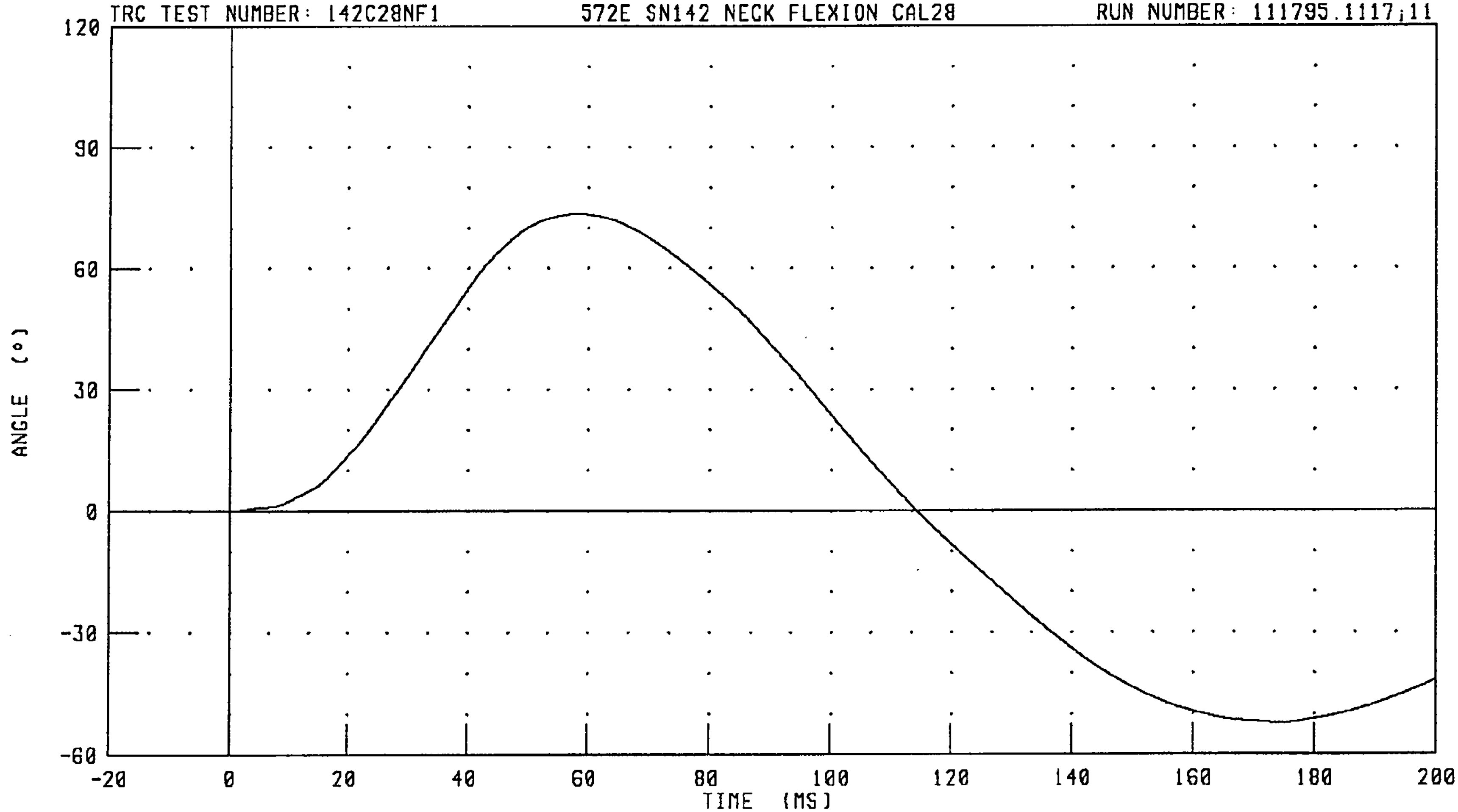
CHANNEL: THETA FILTER: CH. CLASS 60 PEAK DATA: 40.79 ° @ 57.68 MS; -30.22 ° @ 174.72 MS

951101

PART 572-E HYBRID III NECK FLEXION CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER: 142C28NF1 572E SN142 NECK FLEXION CAL28 RUN NUMBER: 111795.1117;11

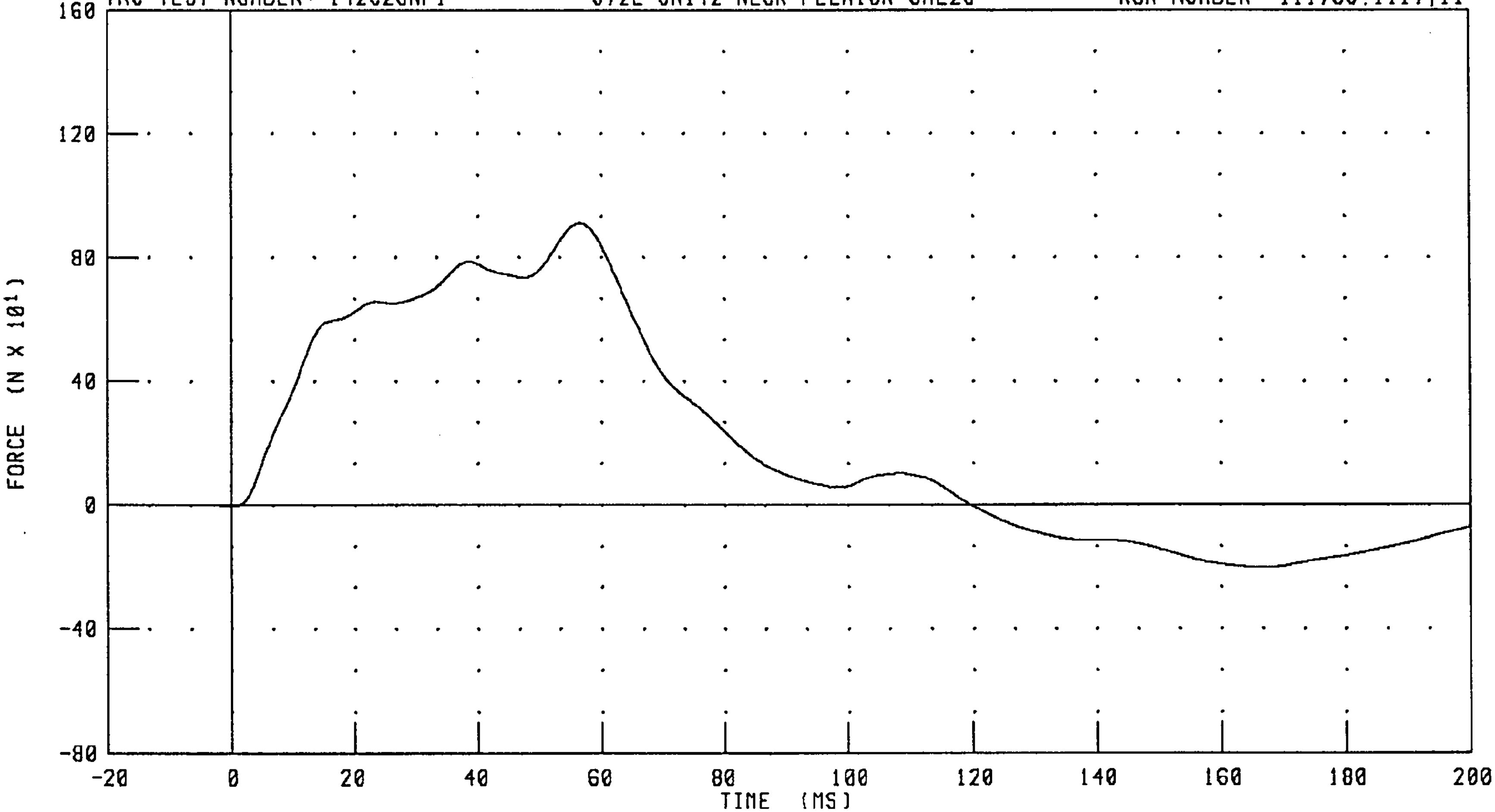


CHANNEL: TOTAN FILTER: CH. CLASS 60 PEAK DATA: 73.48 ° @ 58.16 MS; -52.27 ° @ 174.56 MS

951101

PART 572-E HYBRID III NECK FLEXION CALIBRATION
NECK FORCE X AXIS

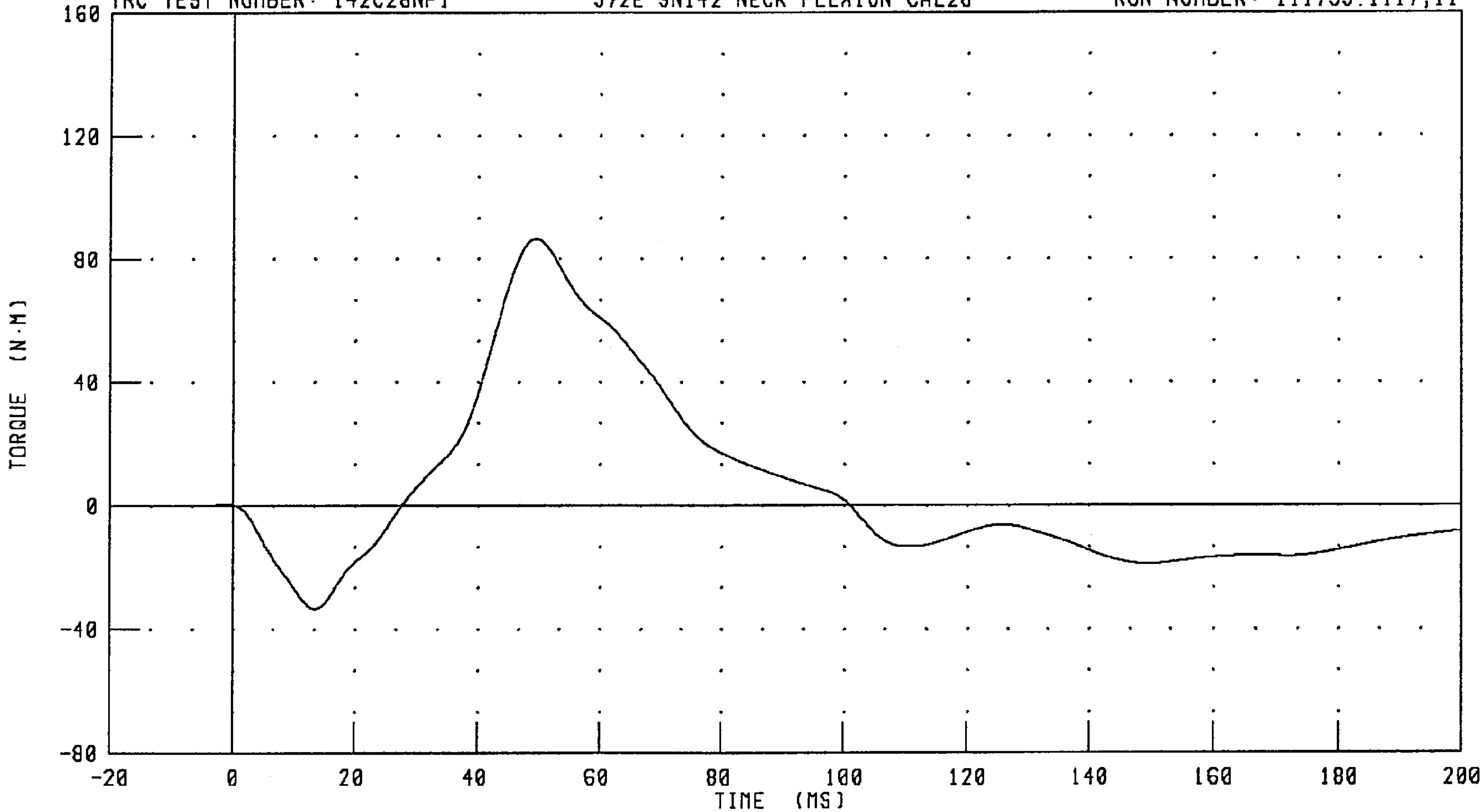
TRC TEST NUMBER: 142C28NF1 572E SN142 NECK FLEXION CAL28 RUN NUMBER: 111795.1117;11



CHANNEL: NEKXF FILTER: CH. CLASS 60 PEAK DATA: 910.05 N @ 56.56 MS; -203.53 N @ 166.64 MS

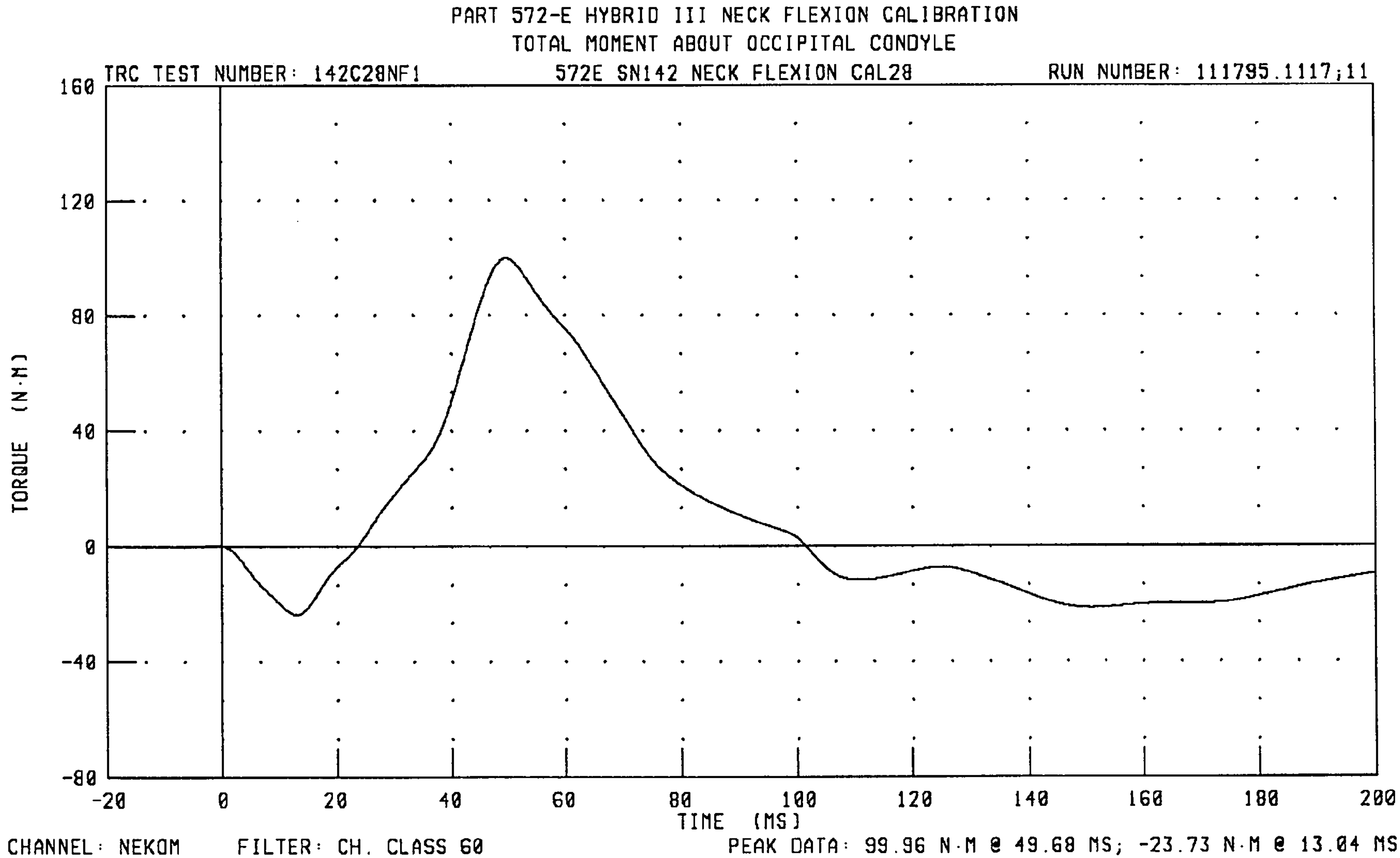
PART 572-E HYBRID III NECK FLEXION CALIBRATION
NECK MOMENT Y AXIS

TRC TEST NUMBER: 142C28NF1 572E SN142 NECK FLEXION CAL28 RUN NUMBER: 111795.1117;11



CHANNEL: NEKYM FILTER: CH. CLASS 60 PEAK DATA: 86.60 N·M @ 49.52 MS; -33.36 N·M @ 13.52 MS

951101


PART 572-E HYBRID III NECK FLEXION CALIBRATION
TOTAL MOMENT ABOUT OCCIPITAL CONDYLE
TRC TEST NUMBER: 142C28NF1
572E SN142 NECK FLEXION CAL28
RUN NUMBER: 111795.1117;11
TORQUE (N·M)
160
120
80
40
0
-40
-80
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: NEKOM
FILTER: CH. CLASS 60
PEAK DATA: 99.96 N·M @ 49.68 MS; -23.73 N·M @ 13.04 MS

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TRANSPORTATION RESEARCH CENTER INC.

NECK EXTENSION TEST - 6 CHANNEL TRANSDUCER

HYBRID III 14-SEP-95

TRC INC. TEST NO: 142C28NE1 572E SN142 NECK EXT. CAL28

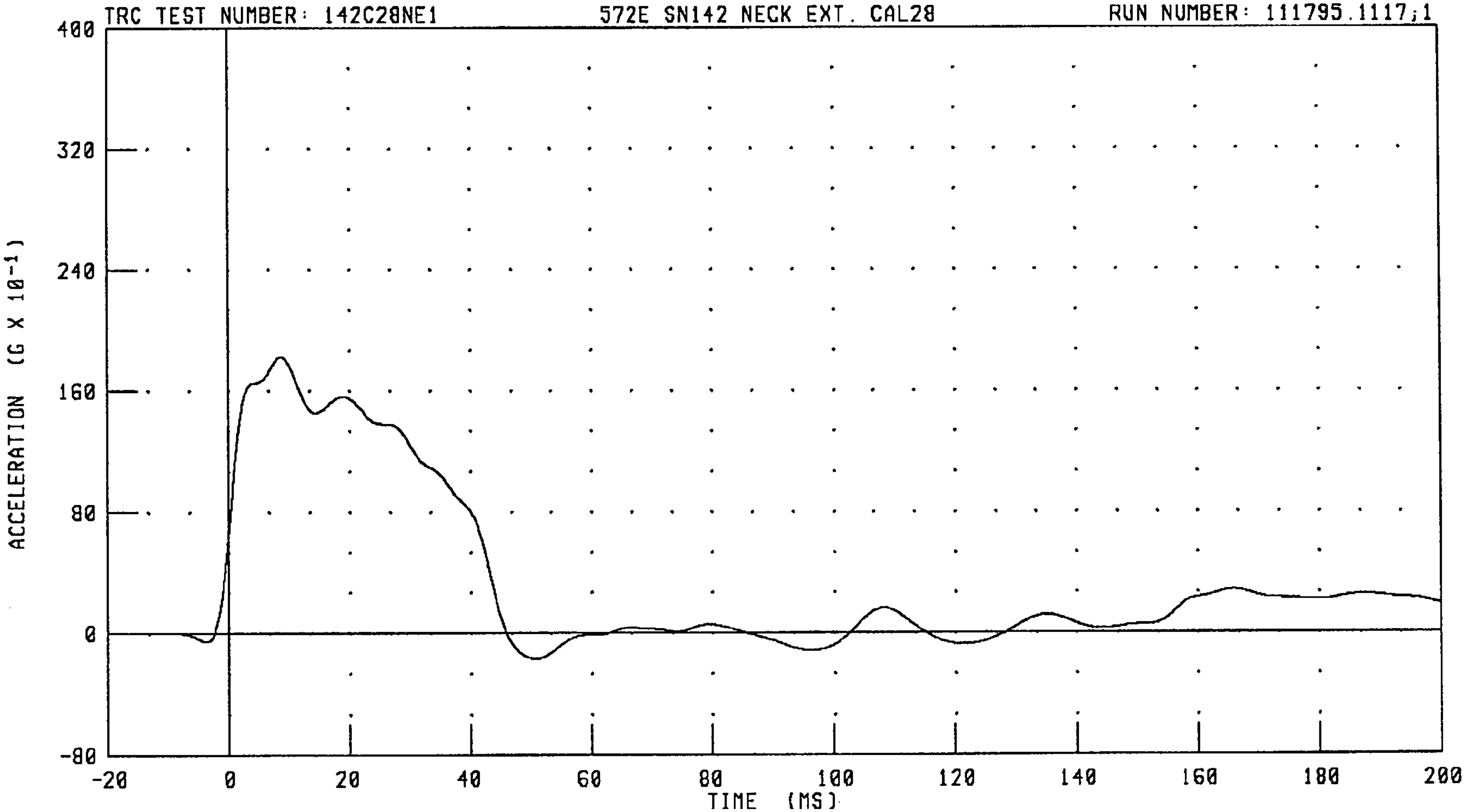
TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6 - 22.2 DEG. C	20.6 DEG. C
RELATIVE HUMIDITY		10 - 70 %	62.0 %
IMPACT VELOCITY		5.95 - 6.19 M/S	6.00 M/S
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G	17.68 G
	20 MS	14.00 - 19.00 G	15.48 G
	30 MS	11.00 - 16.00 G	12.36 G
MAX PENDULUM G		22 G MAX	18.22 G
MAX PENDULUM G ABOVE 30 MS		22 G MAX	12.31 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		38 - 46 MS	42.56 MS
D PLANE ROTATION	MAX	81 - 106 DEG.	94.44 DEG.
	TIME	72 - 82 MS	75.36 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MIN	-80.0/-52.9 NM	-66.14 NM
	TIME	65 - 79 MS	70.32 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	153.92 MS
NEGATIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	136.40 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN Chas. Mitchell RUN NUMBER: 091595.0742;1

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
PENDULUM DECELERATION

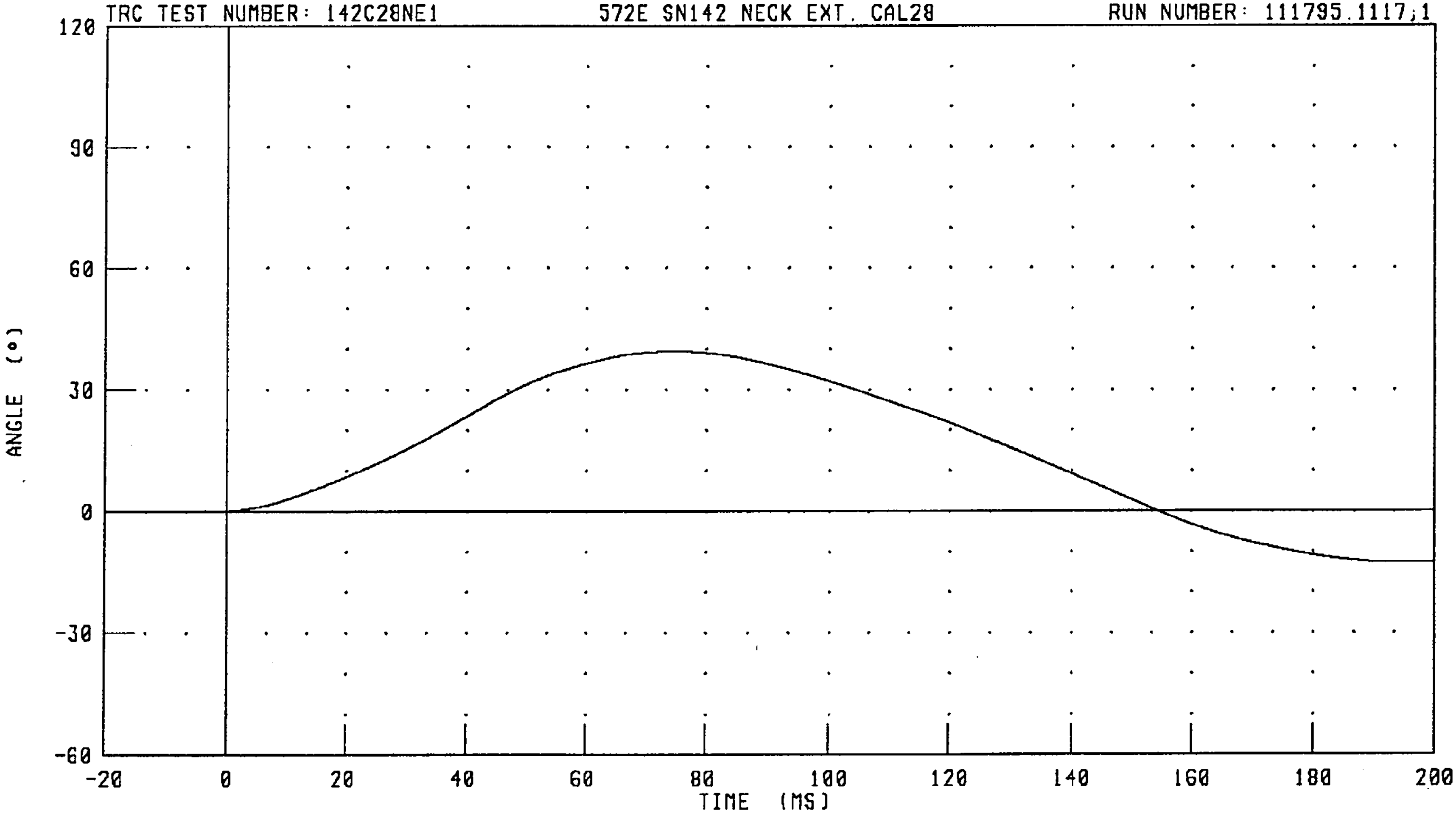
TRC TEST NUMBER: 142C28NE1 572E SN142 NECK EXT. CAL28 RUN NUMBER: 111795.1117;1



CHANNEL: PENXG FILTER: CH. CLASS 60 PEAK DATA: 18.22 G @ 8.72 MS; -1.67 G @ 50.88 MS

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
ROTATION ABOUT BASE OF NECK

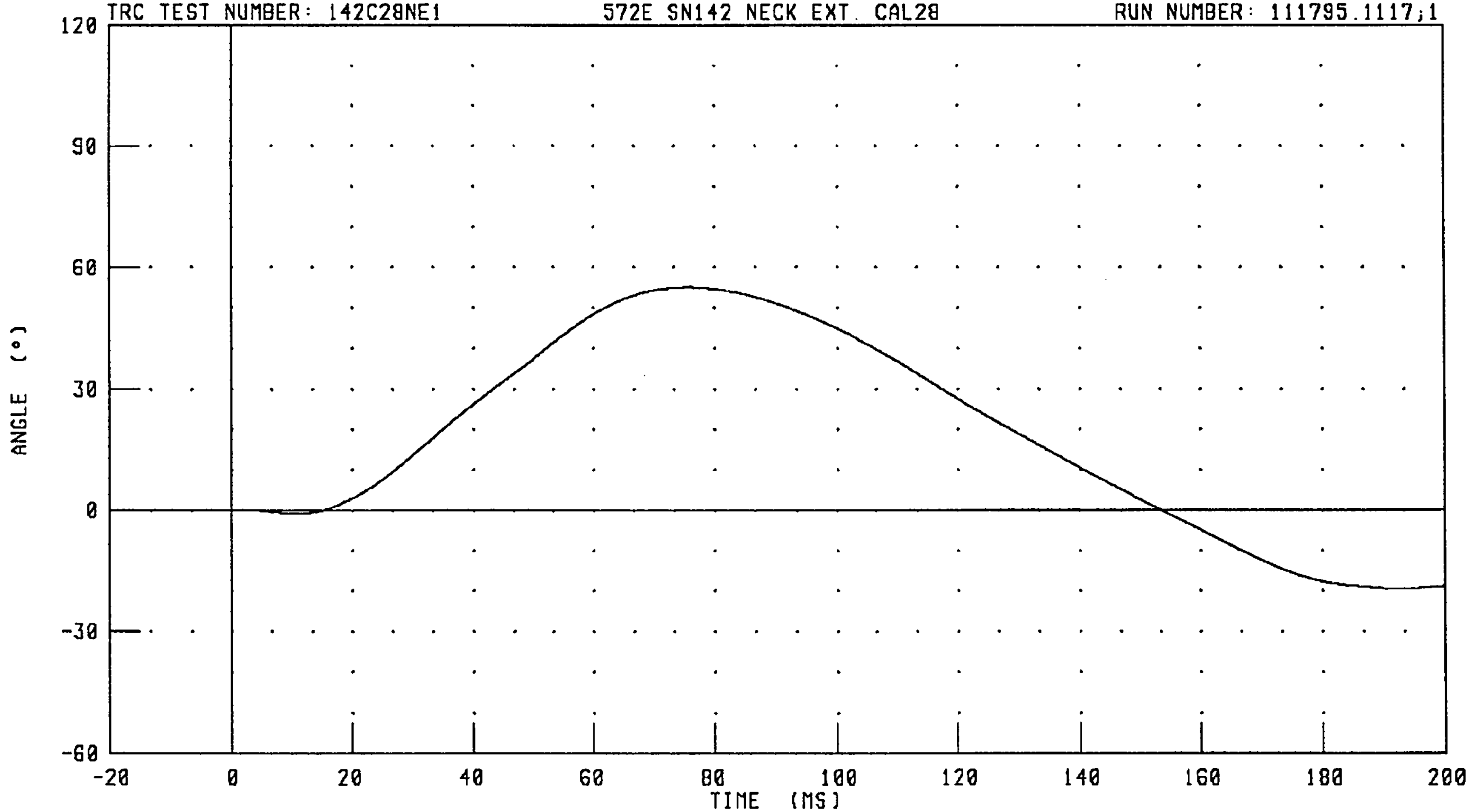
TRC TEST NUMBER: 142C28NE1 572E SN142 NECK EXT. CAL28 RUN NUMBER: 111795.1117;1



CHANNEL: BETA FILTER: CH. CLASS 60 PEAK DATA: 39.42 ° @ 74.48 MS; -12.75 ° @ 193.04 MS

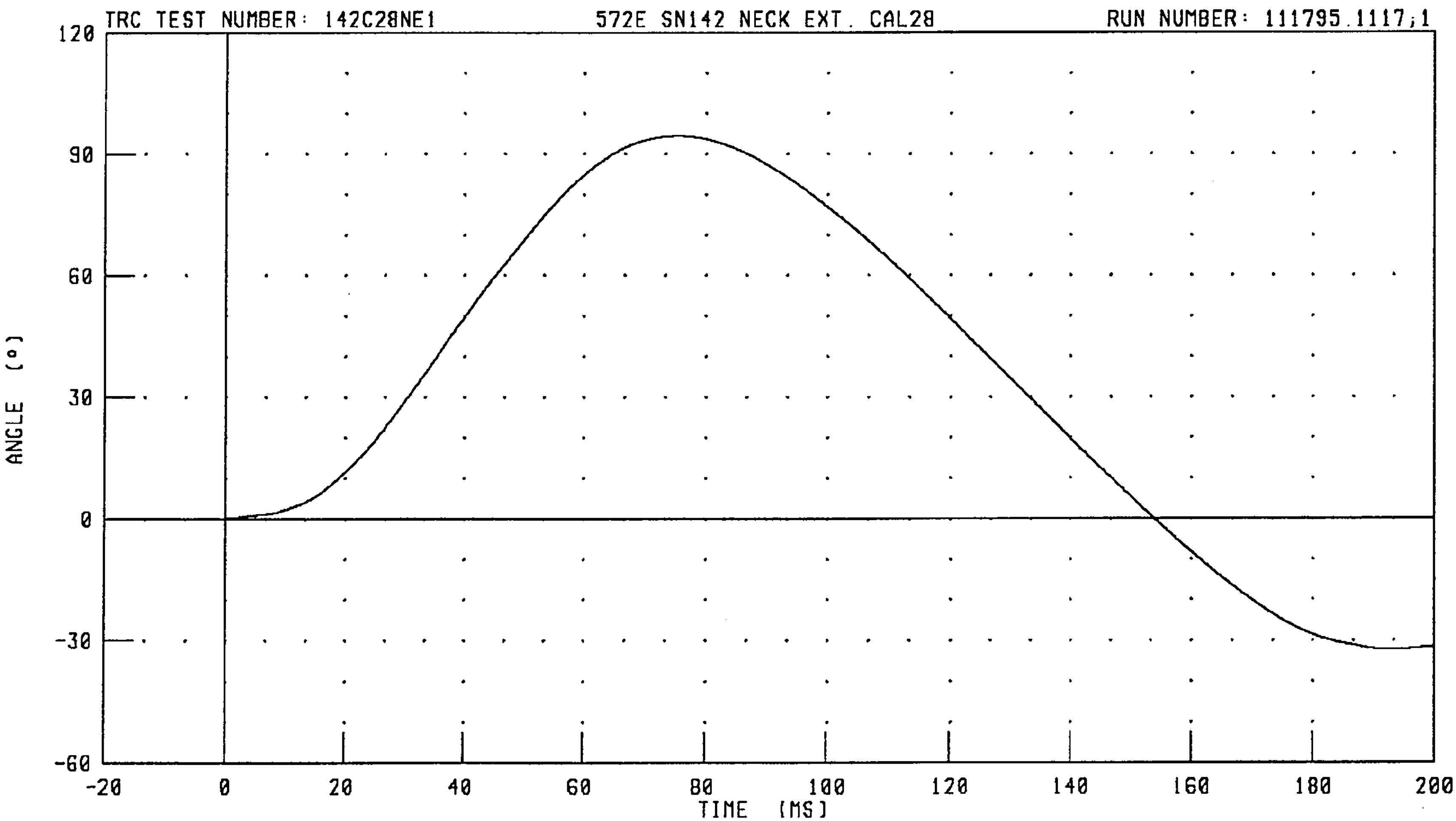
PART 572-E HYBRID III NECK EXTENSION CALIBRATION
ROTATION ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER: 142C28NE1 572E SN142 NECK EXT. CAL28 RUN NUMBER: 111795.1117;1



CHANNEL: THETA FILTER: CH. CLASS 60 PEAK DATA: 55.05 ° @ 75.84 MS; -19.51 ° @ 192.80 MS

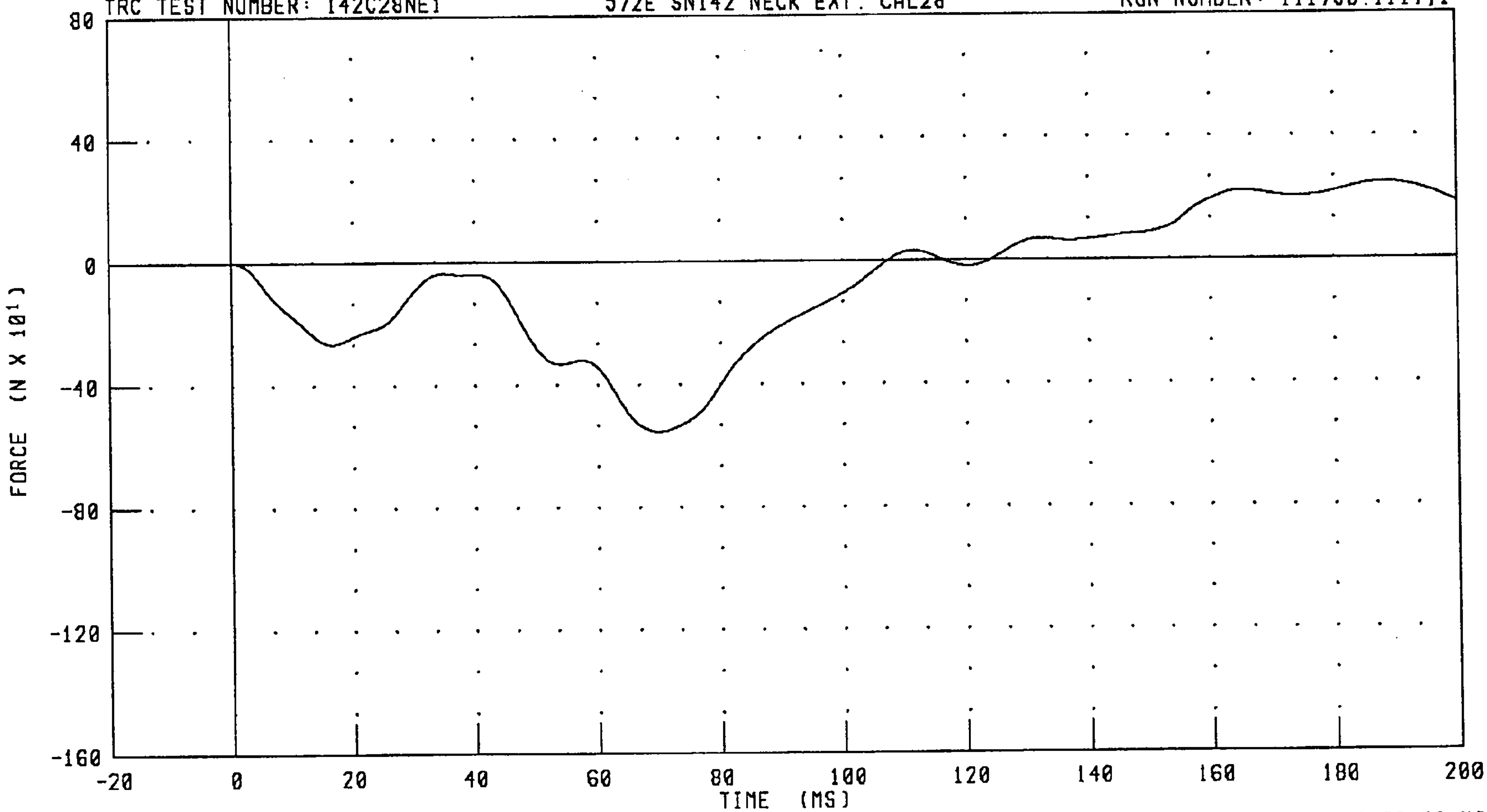
PART 572-E HYBRID III NECK EXTENSION CALIBRATION
TOTAL ROTATION



CHANNEL: TOTAN FILTER: CH. CLASS 60 PEAK DATA: 94.44 ° @ 75.36 MS; -32.26 ° @ 192.88 MS

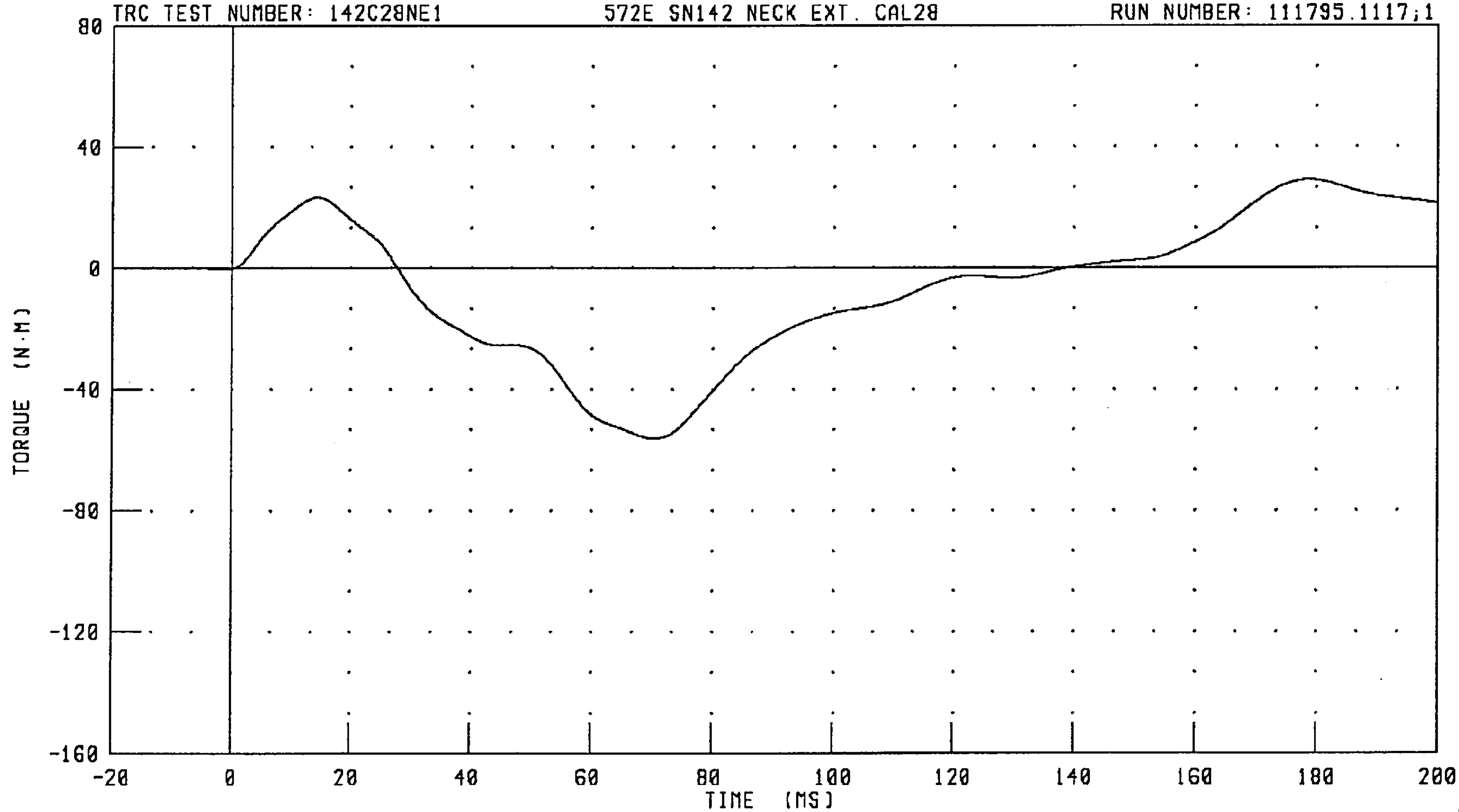
PART 572-E HYBRID III NECK EXTENSION CALIBRATION
NECK FORCE X AXIS

TRC TEST NUMBER: 142C28NE1 572E SN142 NECK EXT. CAL28 RUN NUMBER: 111795.1117;1

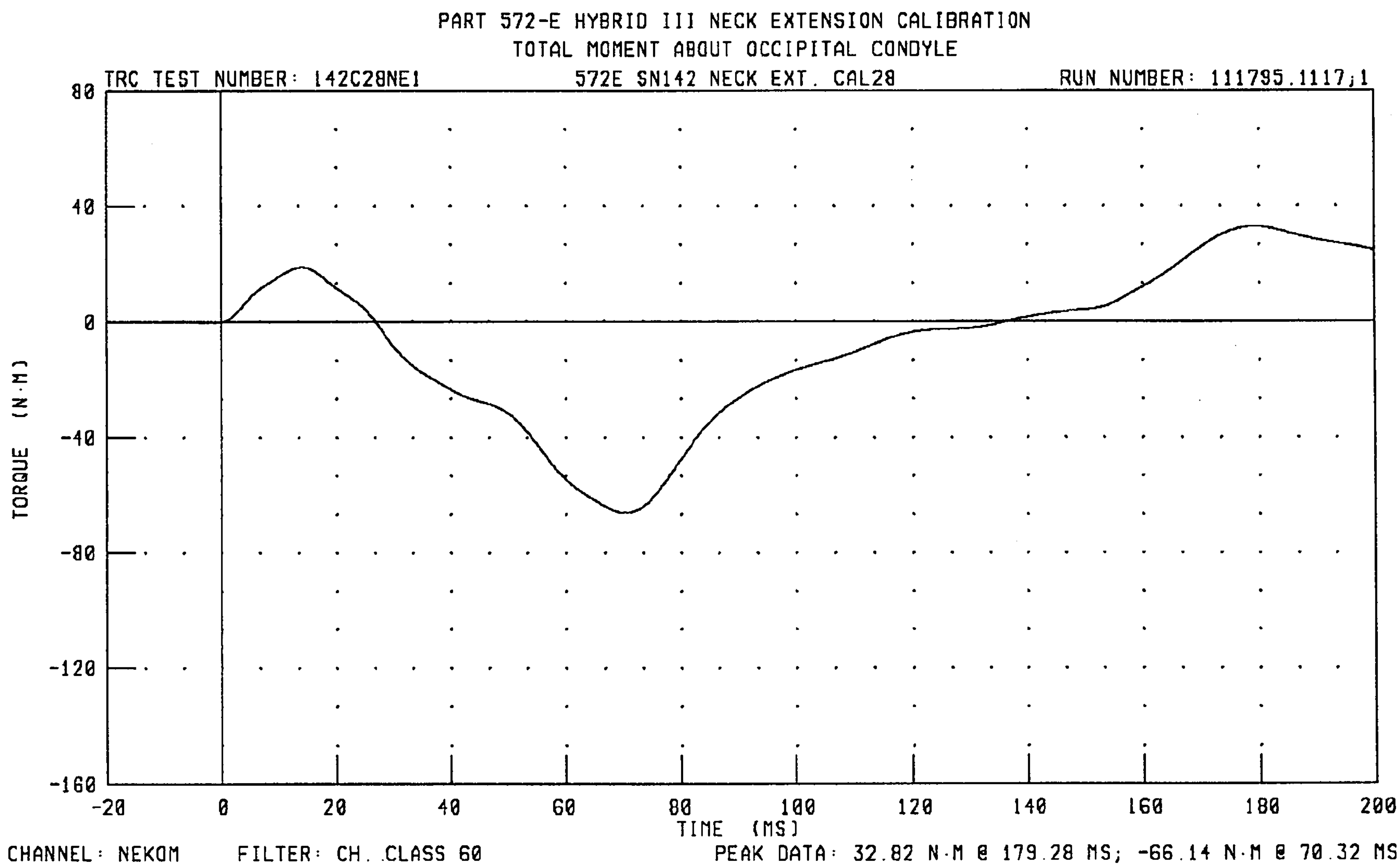


CHANNEL: NEKXF FILTER: CH. CLASS 60 PEAK DATA: 247.70 N @ 188.40 MS; -554.51 N @ 69.92 MS

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
NECK MOMENT Y AXIS



CHANNEL: NEKYM FILTER: CH. CLASS 60 PEAK DATA: 29.03 N·M @ 178.88 MS; -56.29 N·M @ 70.40 MS


PART 572-E HYBRID III NECK EXTENSION CALIBRATION
TOTAL MOMENT ABOUT OCCIPITAL CONDYLE
TRC TEST NUMBER: 142C28NE1
572E SN142 NECK EXT. CAL28
RUN NUMBER: 111795.1117;1
TORQUE (N·M)
80
40
0
-40
-80
-120
-160
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: NEKOM
FILTER: CH. CLASS 60
PEAK DATA: 32.82 N·M @ 179.28 MS; -66.14 N·M @ 70.32 MS

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TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

HYBRID III 15-SEP-95

TRC INC. TEST NO: 142C28TH1 572E SN142 H.S.THORAX CAL28

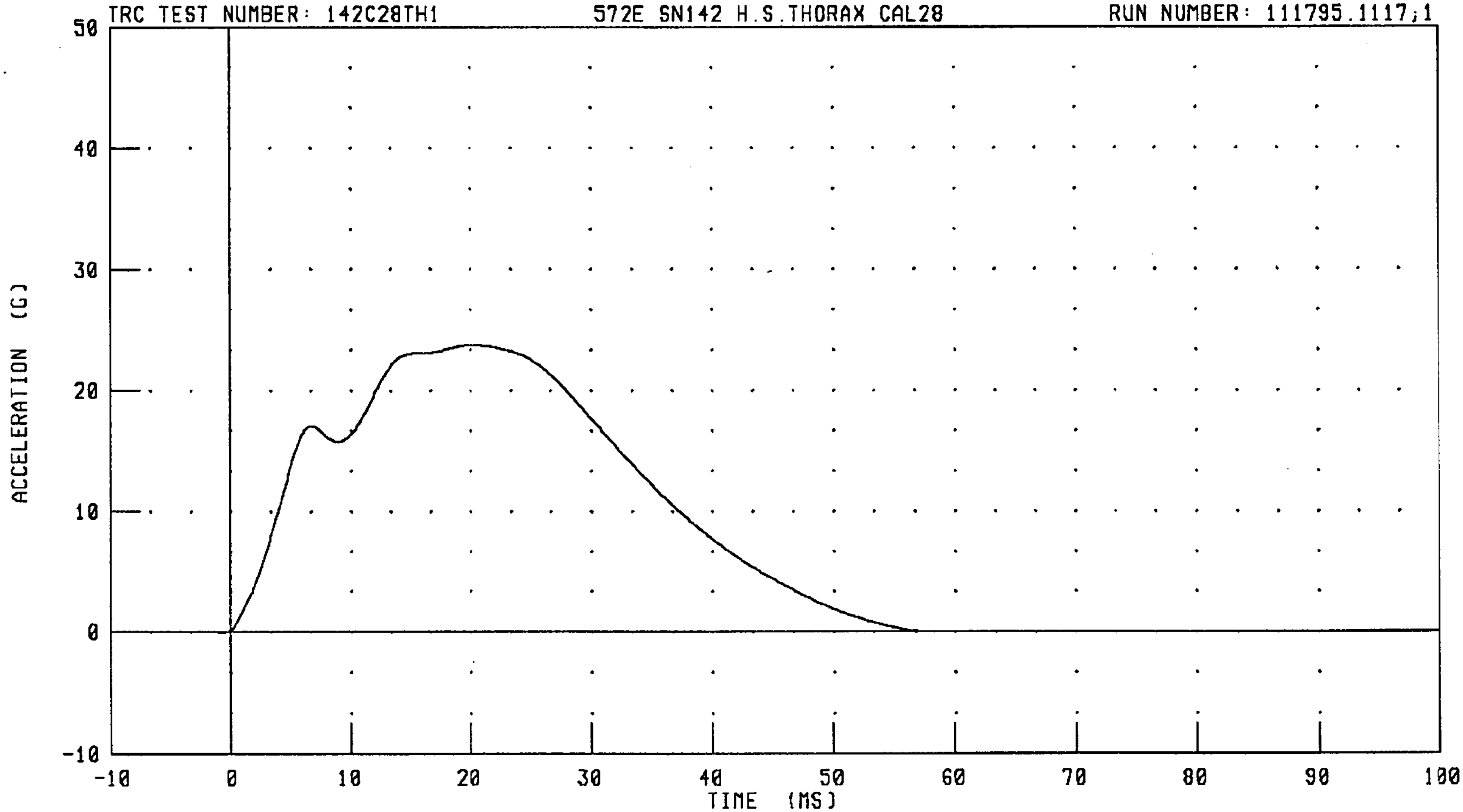
TEST PARAMETER	HIGH SPEED TEST SPECIFICATION	TEST RESULTS
TEMPERATURE	20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	62.0 %
PENDULUM VELOCITY	6.59 - 6.83 M/S	6.65 M/S
MAXIMUM DEFLECTION	63.5 - 72.6 MM	68.6 MM
MAXIMUM RESISTIVE FORCE	5159 - 5894 N	5435. N
INTERNAL HYSTERESIS	69% - 85%	73.4%

TEST MEETS SPECIFICATIONS

TECHNICIAN Chas. Middle RUN NUMBER: 091595.1343;1

PART 572-E HYBRID III THORAX CALIBRATION
PENDULUM DECELERATION

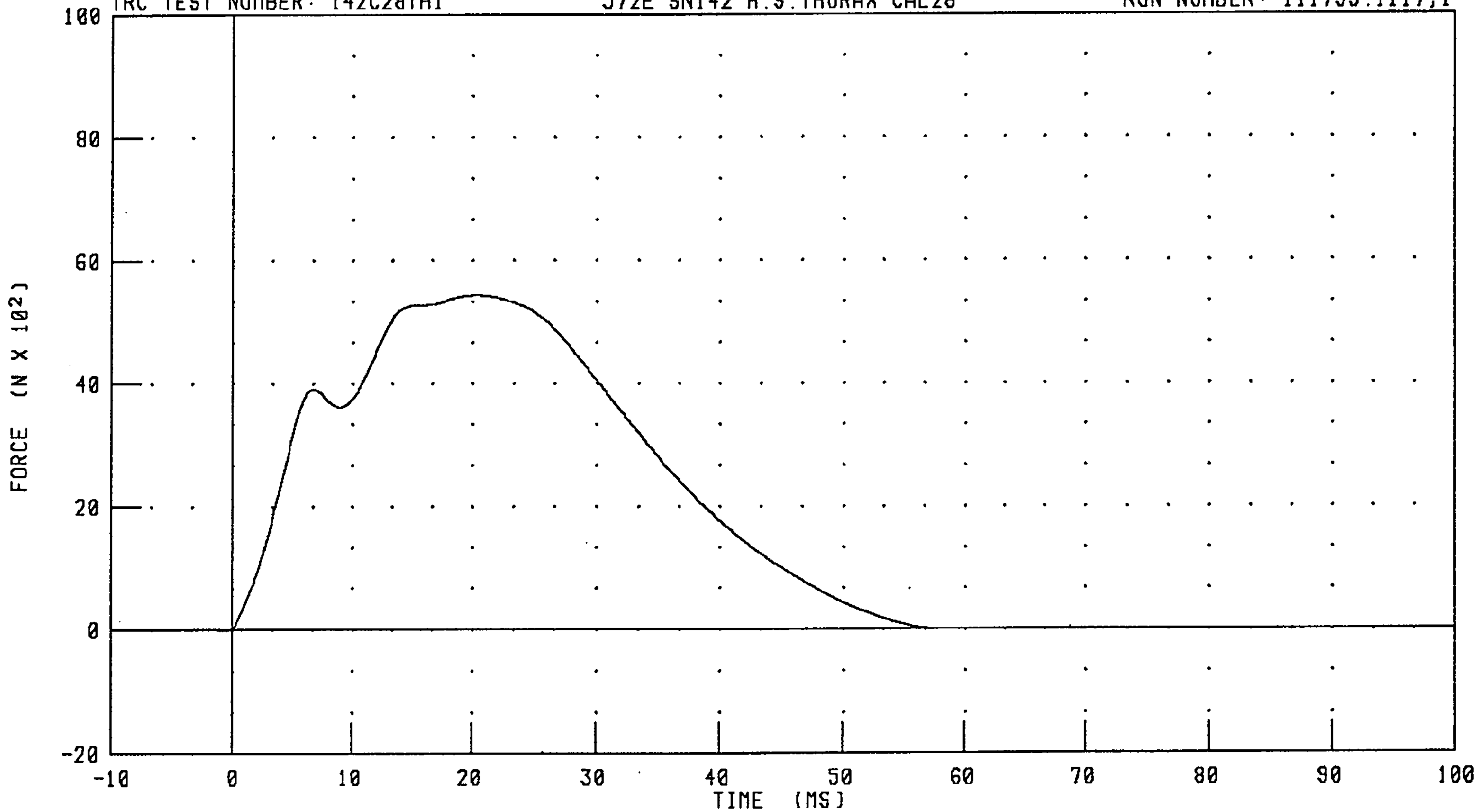
TRC TEST NUMBER: 142C28TH1   572E SN142 H.S.THORAX CAL28   RUN NUMBER: 111795.1117;1



CHANNEL: PENXG   FILTER: CH. CLASS 180   PEAK DATA: 23.73 G @ 20.40 MS; -0.04 G @ -0.72 MS

PART 572-E HYBRID III THORAX CALIBRATION
PENDULUM FORCE

TRC TEST NUMBER: 142C28TH1 572E SN142 H.S.THORAX CAL28 RUN NUMBER: 111795.1117;1



CHANNEL: PENXF FILTER: CH. CLASS 180 PEAK DATA: 5435.08 N @ 20.40 MS; -8.99 N @ -0.72 MS

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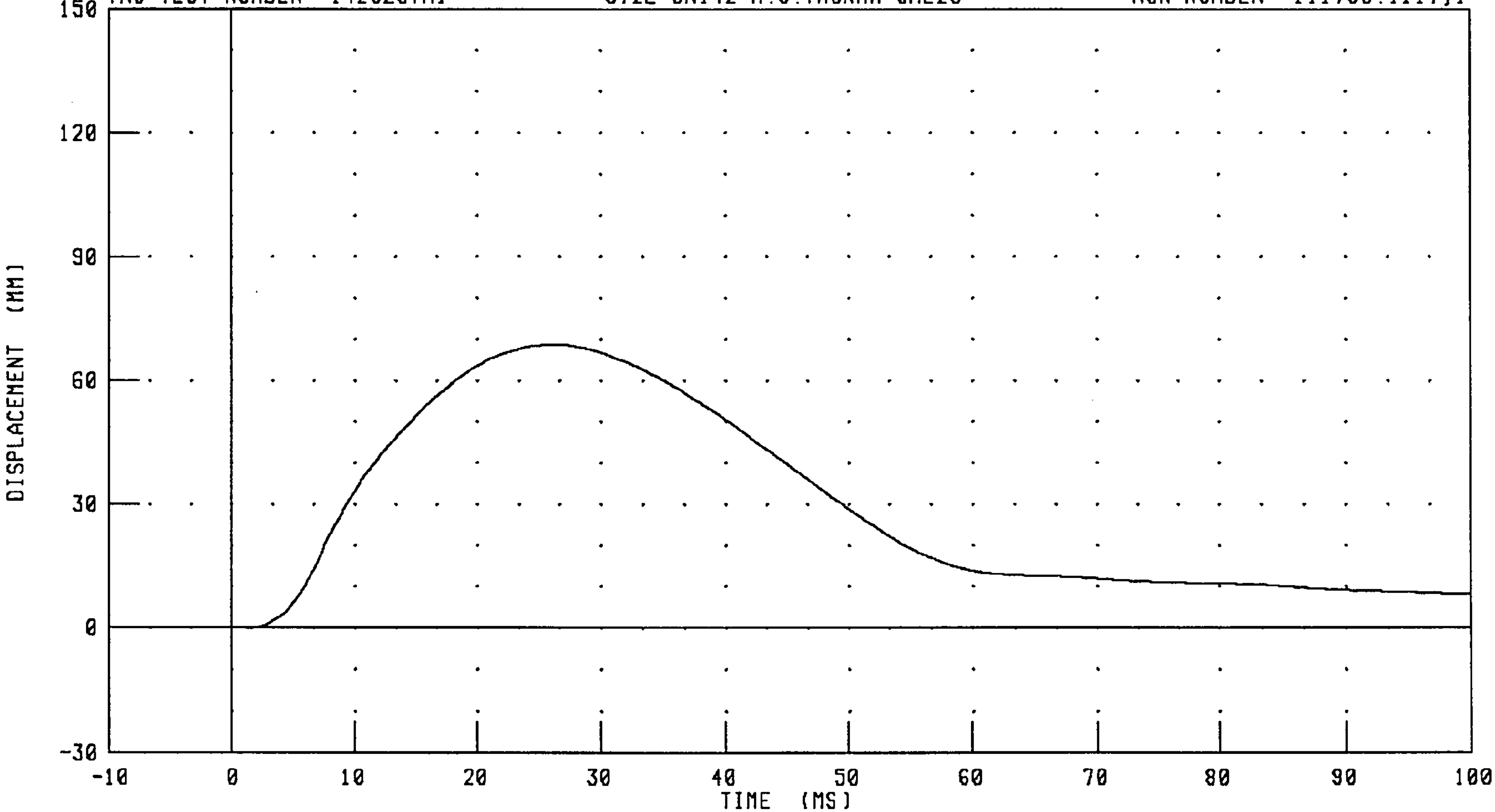
PART 572-E HYBRID III THORAX CALIBRATION
STERNUM DISPLACEMENT

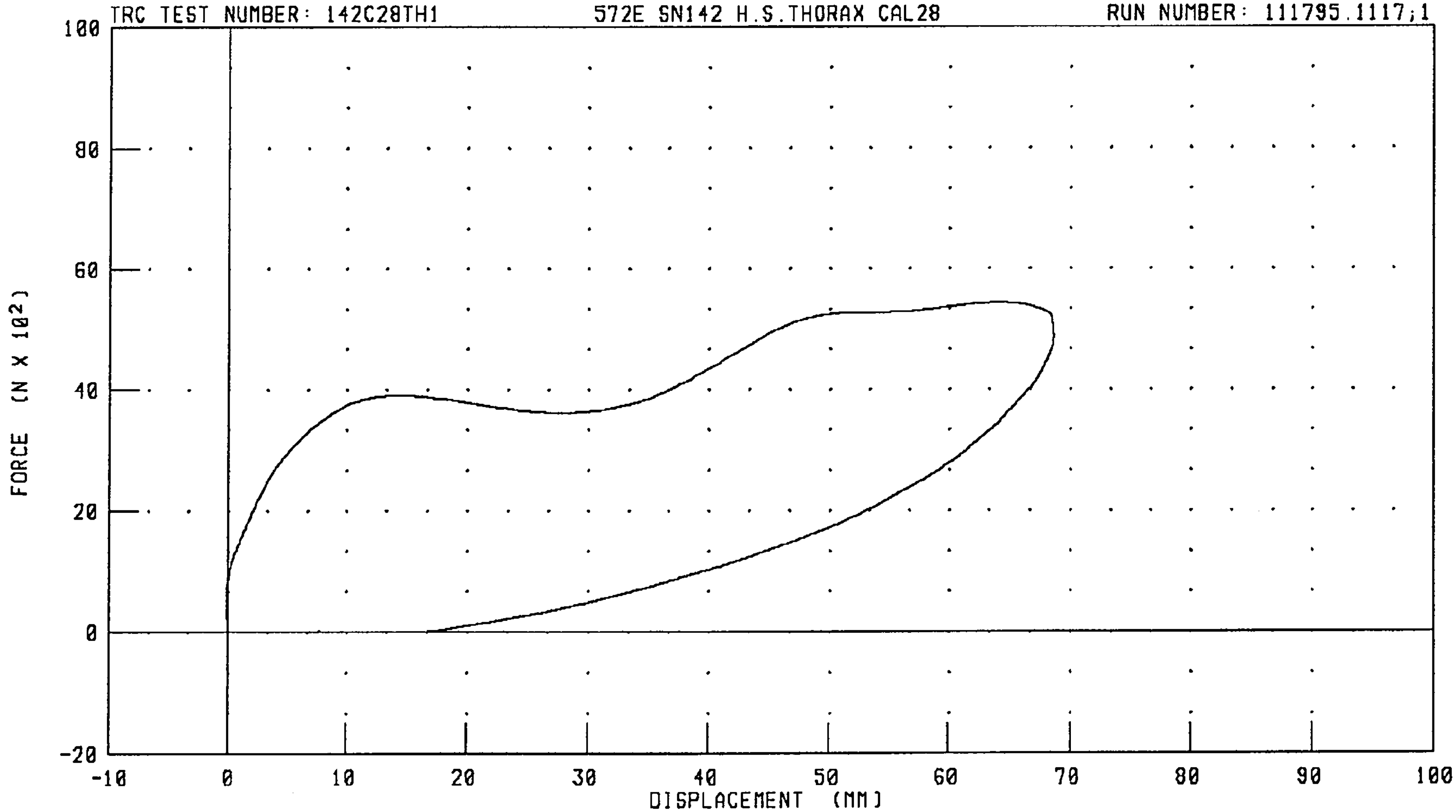
TRC TEST NUMBER: 142C28TH1 572E SN142 H.S.THORAX CAL28 RUN NUMBER: 111795.1117;1



CHANNEL: CSTXD FILTER: CH. CLASS 180 PEAK DATA: 68.64 MM @ 26.64 MS; -0.06 MM @ 1.44 MS

PART 572-E HYBRID III THORAX CALIBRATION
CHEST DISPLACEMENT VS PENDULUM FORCE

TRC TEST NUMBER: 142C28TH1 572E SN142 H.S.THORAX CAL28 RUN NUMBER: 111795.1117;1



CHANNEL: CSTXD FILTER: CH. CLASS 180 PEAK DATA: 68.64 MM @ 26.64 MS; -0.06 MM @ 1.44 MS
PENXF CH. CLASS 180 5435.08 N @ 20.40 MS; -8.99 N @ -0.72 MS

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TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

HYBRID III 13-SEP-95

TRC INC. TEST NO: 142C28RK1 572E SN142 RIGHT KNEE CAL 28

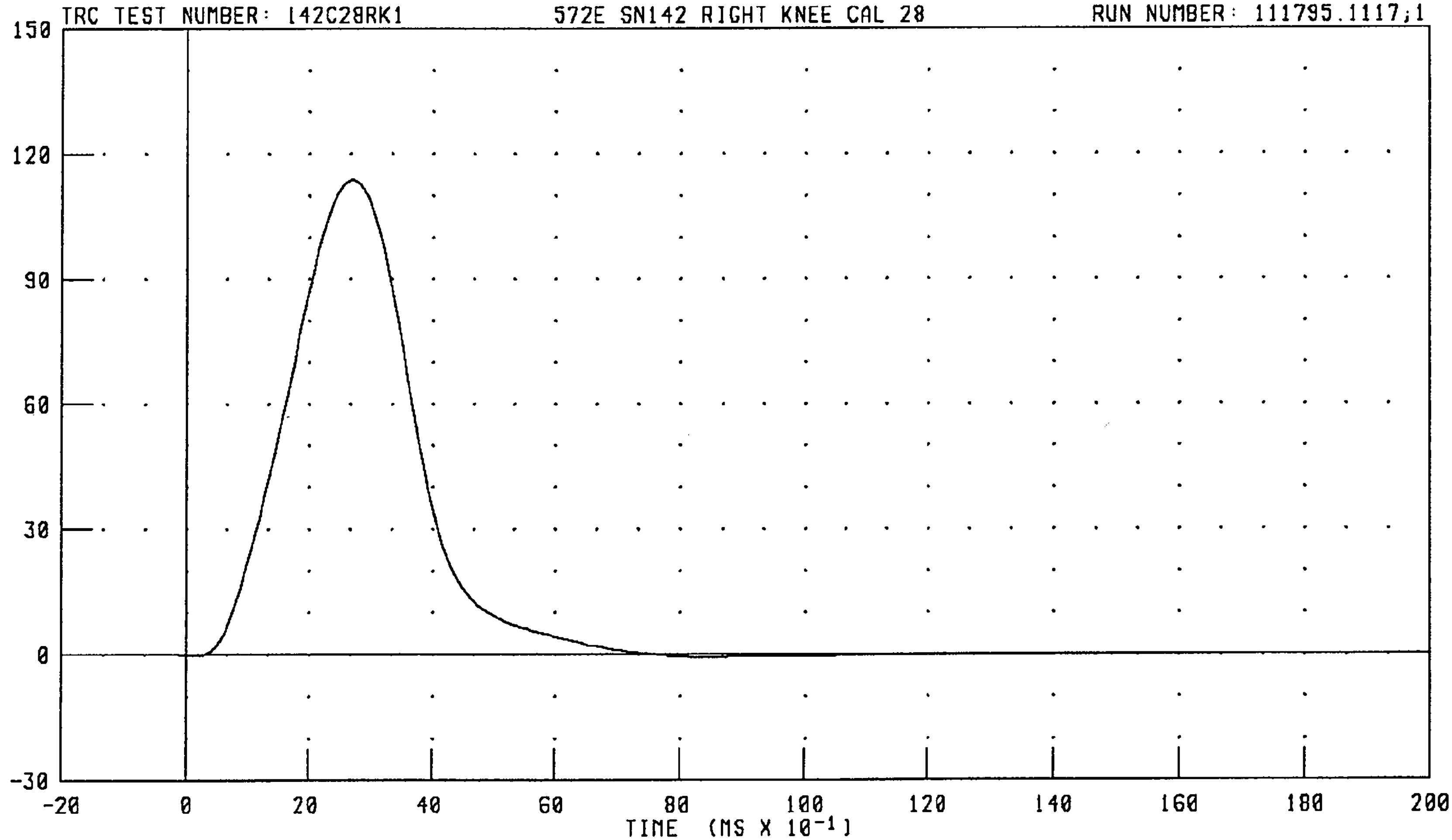
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	20.6 DEG. C
RELATIVE HUMIDITY	10 - 70 %	60.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.11 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	5566.5 N

TEST MEETS SPECIFICATIONS

TECHNICIAN Chas. Middleton RUN NUMBER: 091395.1356;1

PART 572-E HYBRID III RIGHT KNEE CALIBRATION
PENDULUM DECELERATION (5 KG PEND.)

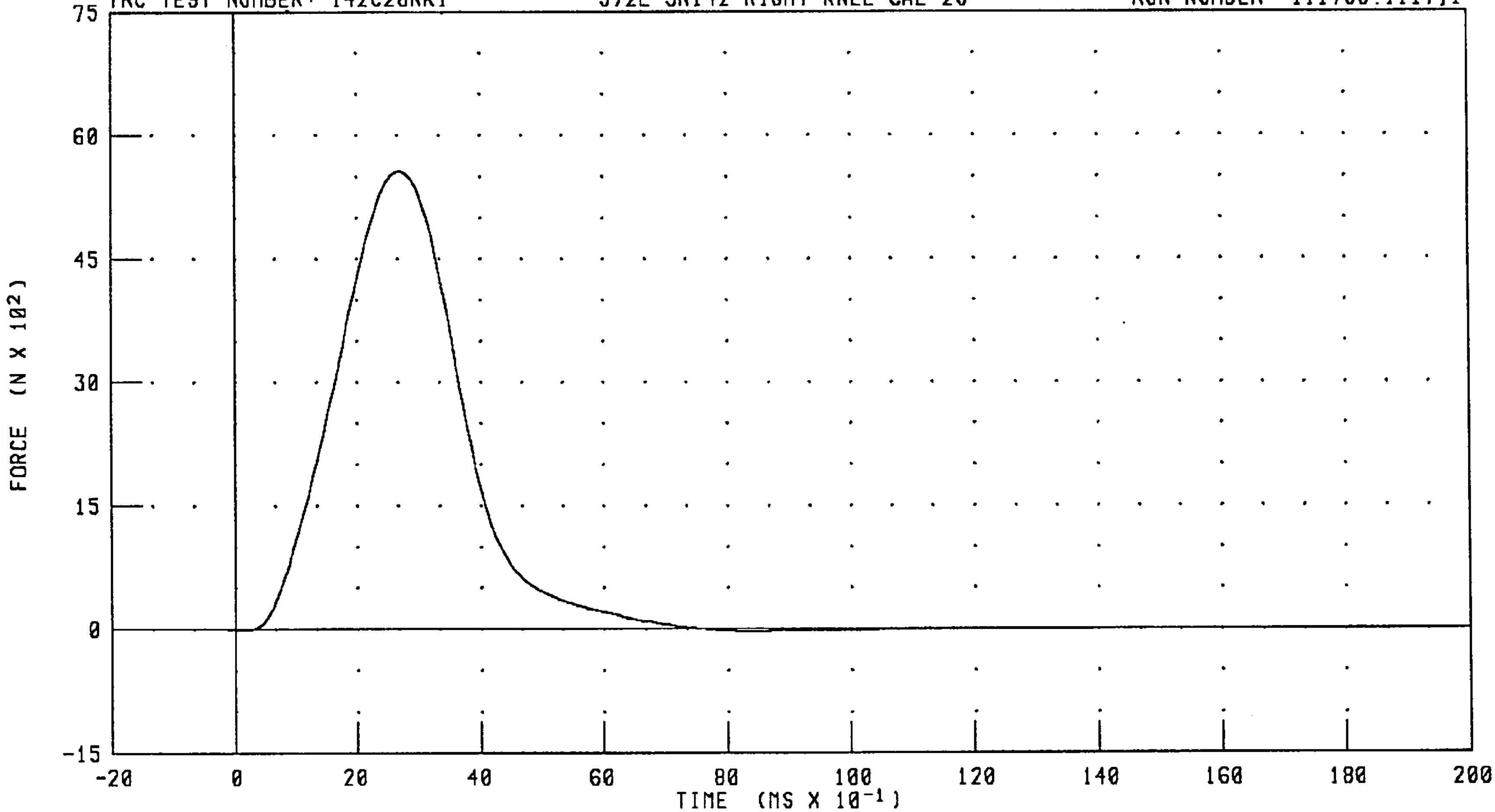
TRC TEST NUMBER: 142C28RK1 572E SN142 RIGHT KNEE CAL 28 RUN NUMBER: 111795.1117;1



CHANNEL: PENXG FILTER: CH. CLASS 600 PEAK DATA: 113.77 G @ 2.72 MS; -0.64 G @ 8.40 MS

PART 572-E HYBRID III RIGHT KNEE CALIBRATION
PENDULUM FORCE (5 KG PEND.)

TRC TEST NUMBER: 142C28RK1 572E SN142 RIGHT KNEE CAL 28 RUN NUMBER: 111795.1117;1



CHANNEL: PENXF FILTER: CH. CLASS 600 PEAK DATA: 5566.56 N @ 2.72 MS; -31.24 N @ 8.40 MS

TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

HYBRID III 13-SEP-05

TRC INC. TEST NO: 142C28LK1 572E SN142 LEFT KNEE CAL 28

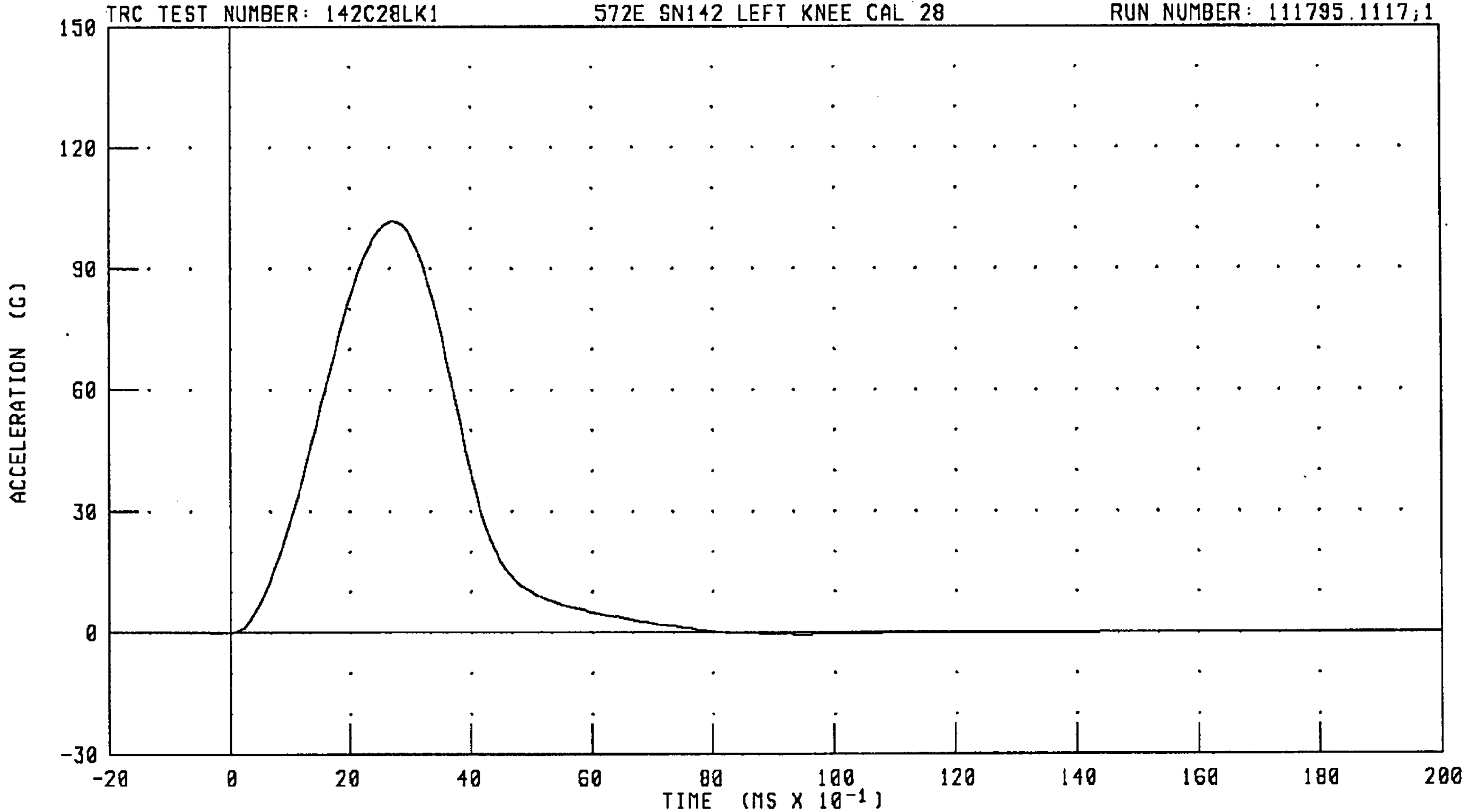
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	20.6 DEG. C
RELATIVE HUMIDITY	10 - 70 %	60.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.11 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	4977.8 N

TEST MEETS SPECIFICATIONS

TECHNICIAN Chas. Middlt RUN NUMBER: 091395.1350;1

PART 572-E HYBRID III LEFT KNEE CALIBRATION
PENDULUM DECELERATION (5 KG PEND.)

TRC TEST NUMBER: 142C28LK1 572E SN142 LEFT KNEE CAL 28 RUN NUMBER: 111795.1117;1



CHANNEL: PENXG FILTER: CH. CLASS 600 PEAK DATA: 101.74 G @ 2.72 MS; -0.59 G @ 9.52 MS

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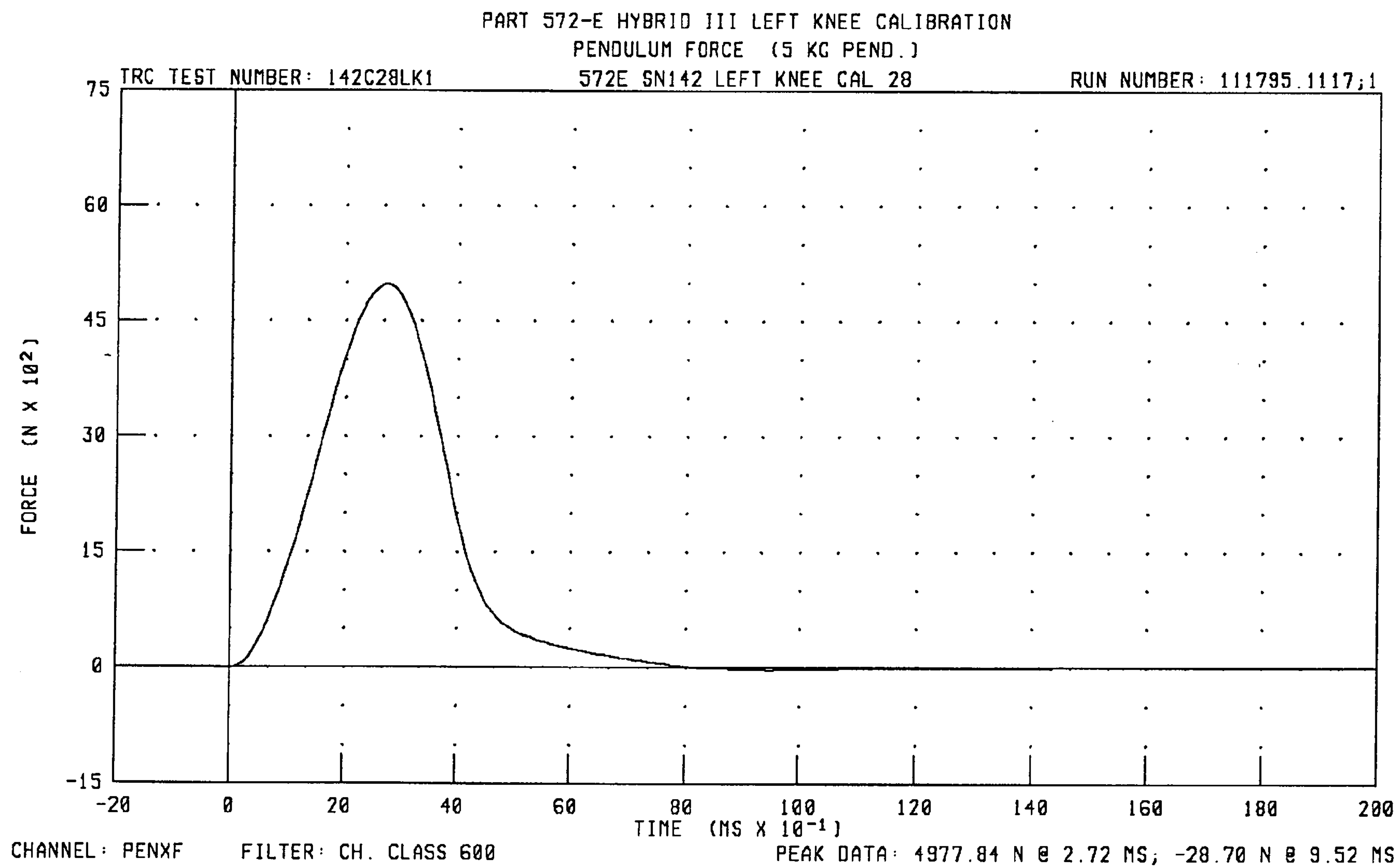


PART 572-E HYBRID III LEFT KNEE CALIBRATION
PENDULUM FORCE (5 KG PEND.)
TRC TEST NUMBER: 142C28LK1
572E SN142 LEFT KNEE CAL 28
RUN NUMBER: 111795.1117;1
75
60
45
30
15
0
-15
FORCE (N X 10²)
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS X 10⁻¹)
CHANNEL: PENXF
FILTER: CH. CLASS 600
PEAK DATA: 4977.84 N @ 2.72 MS; -28.70 N @ 9.52 MS

951101

<u>Pre-test Certification Data</u>

Passenger Dummy S/N: 192

TRANSPORTATION RESEARCH CENTER INC.
HYBRID III EXTERNAL DIMENSIONS
192 ALDERSON 13-SEP-95
TRC INC. TEST NO: 192C27ED1 572E SN192' EXT.DIMENSION CAL27

TEST PARAMETER	(DIMEN.)	SPECIFICATION	TEST RESULTS
LOCATION FOR CHEST CIRCUMFERENCE	(AA)	429 - 434 MM	432. MM
LOCATION FOR WAIST CIRCUMFERENCE	(BB)	226 - 231 MM	229. MM
CHEST CIRCUMFERENCE	(Y)	970 -1001 MM	980. MM
WAIST CIRCUMFERENCE	(Z)	836 - 866 MM	851. MM
CHEST DEPTH	(O)	213 - 229 MM	218. MM
H-POINT HEIGHT	(C)	84 - 89 MM	84. MM
H-POINT FROM SEATBACK	(D)	135 - 140 MM	135. MM
SKULL CAP TO BACKLINE	(H)	41 - 46 MM	43. MM
TOTAL SITTING HEIGHT	(A)	879 - 889 MM	889. MM
THIGH CLEARANCE	(F)	140 - 155 MM	150. MM
BUTTOCK KNEE LENGTH	(K)	579 - 605 MM	597. MM
BUTTOCK POPLITEAL LENGTH	(N)	452 - 478 MM	470. MM
POPLITEAL HEIGHT	(L)	429 - 455 MM	447. MM
KNEE PIVOT HEIGHT	(M)	485 - 500 MM	493. MM
FOOT LENGTH	(P)	252 - 267 MM	259. MM
FOOT BREADTH	(W)	91 - 107 MM	102. MM
SHOULDER PIVOT FROM BACKLINE	(E)	84 - 94 MM	94. MM
SHOULDER BREADTH	(V)	422 - 437 MM	429. MM
SHOULDER PIVOT HEIGHT	(B)	506 - 521 MM	516. MM
ELBOW REST HEIGHT	(J)	191 - 211 MM	211. MM
SHOULDER-ELBOW LENGTH	(I)	330 - 345 MM	345. MM
BACK OF ELBOW TO WRIST PIVOT	(G)	290 - 305 MM	290. MM

DUMMY MEETS SPECIFICATIONS
TECHNICIAN Chas. Middlt RUN NUMBER: 092595.0956

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

HYBRID III 24-OCT-95

TRC INC. TEST NO: 192C27HD4 572E SN192 HEAD DROP CAL 27

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	60.0 %
PEAK RESULTANT ACCELERATION	225 - 275 G	248.16 G
PEAK LATERAL ACCELERATION	15 G MAX	-4.70 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

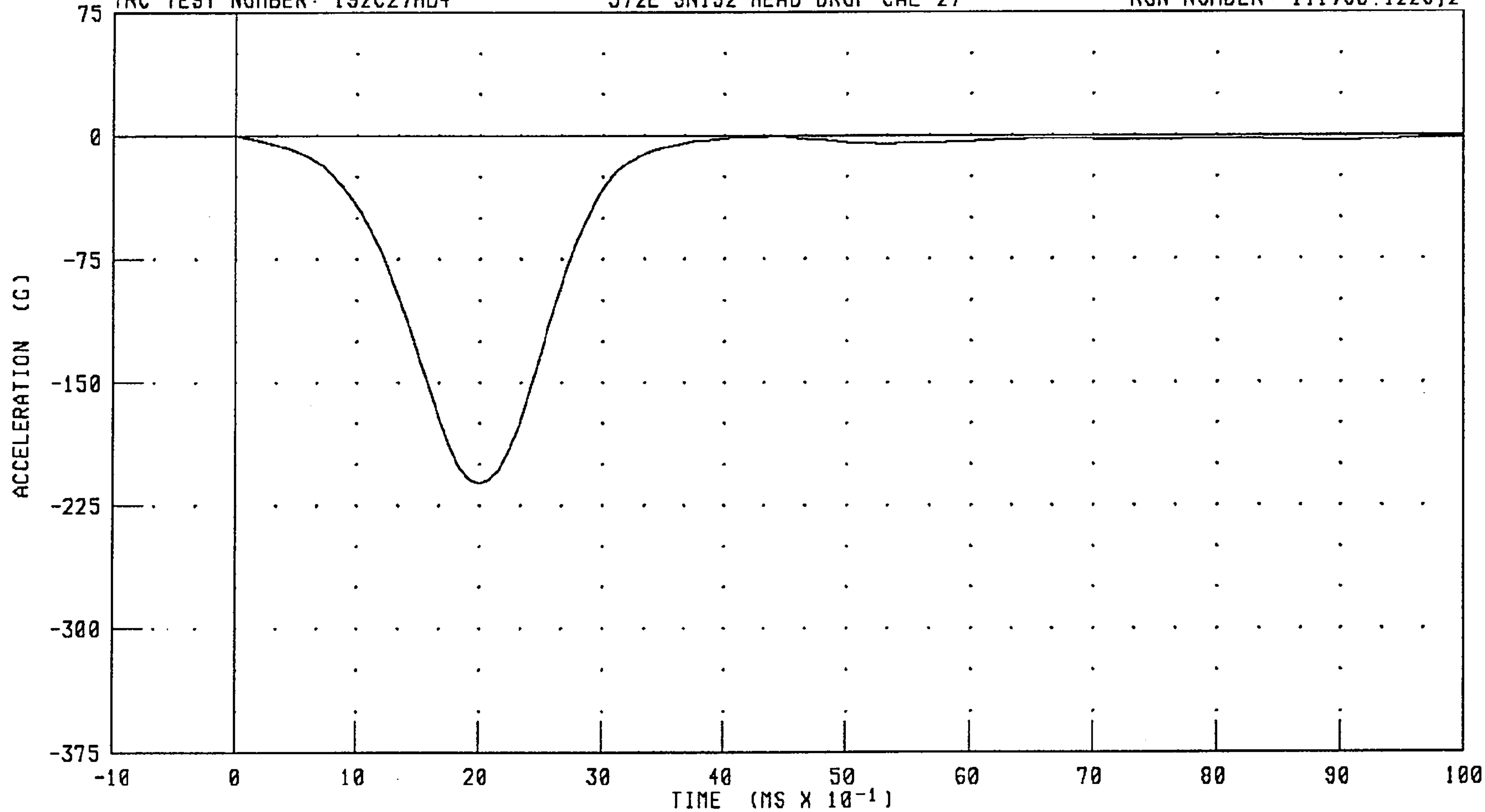
REDUNDANT ACCELEROMETER MOUNT WITH 6 ACCELS.

TEST MEETS SPECIFICATIONS

TECHNICIAN Chas. Middle RUN NUMBER: 111595.1427;2

PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION X AXIS

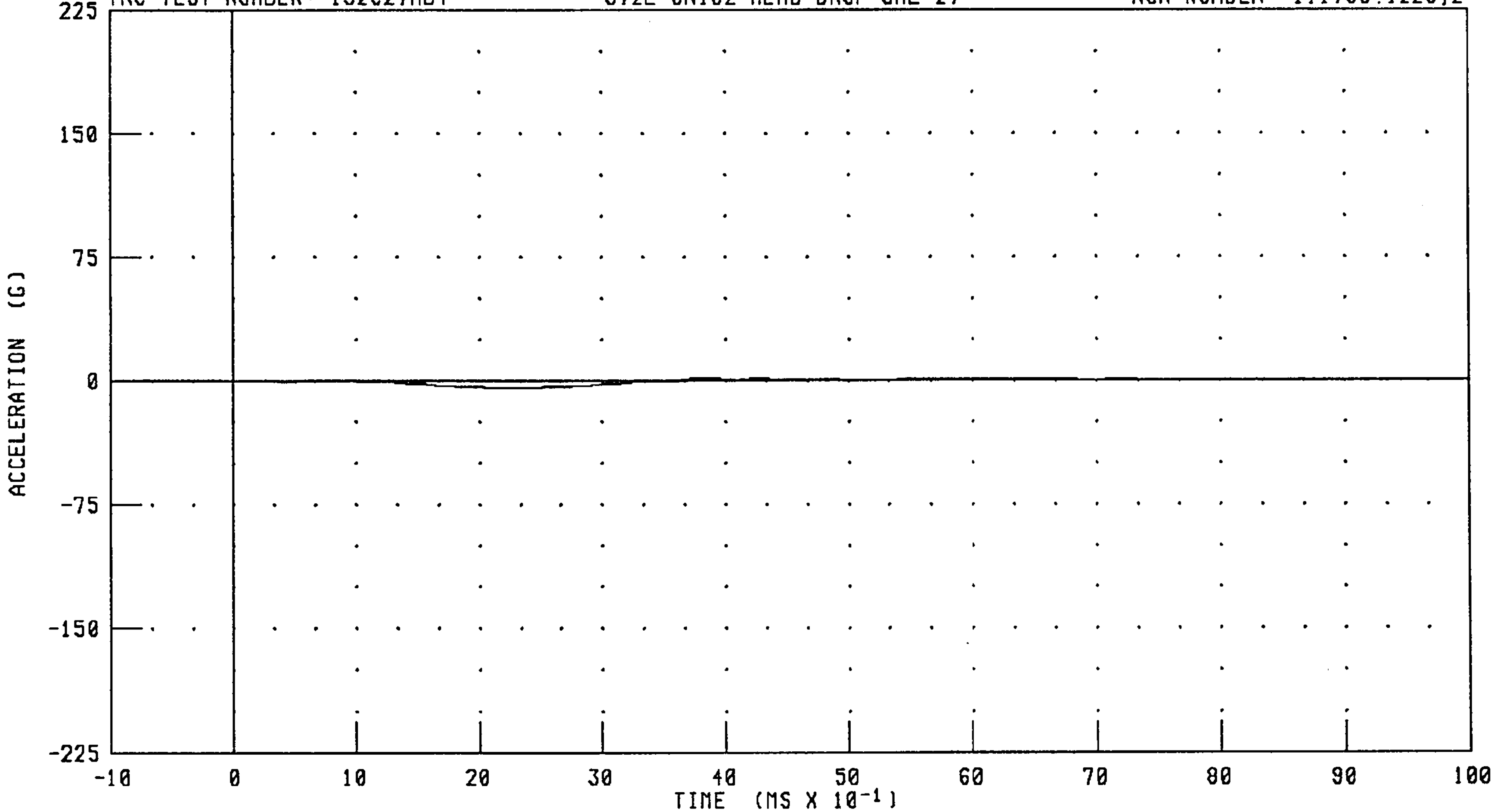
TRC TEST NUMBER: 192C27HD4 572E SN192 HEAD DROP CAL 27 RUN NUMBER: 111795.1228;2



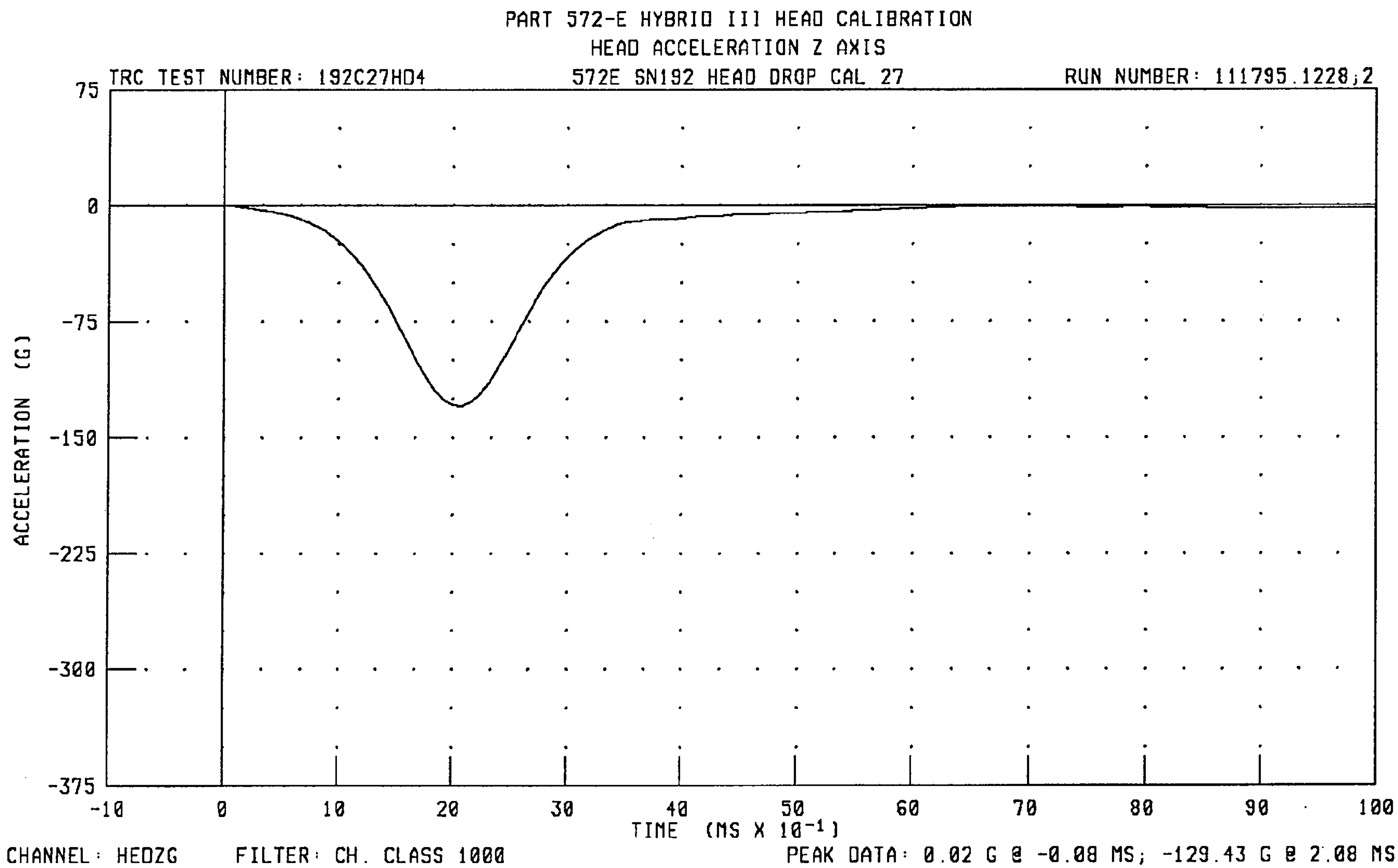
CHANNEL: HEDXG FILTER: CH. CLASS 1000 PEAK DATA: 0.04 G @ -0.08 MS; -211.84 G @ 2.00 MS

PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION Y AXIS

TRC TEST NUMBER: 192C27HD4   572E SN192 HEAD DROP CAL 27   RUN NUMBER: 111795.1228;2



CHANNEL: HEDYG   FILTER: CH. CLASS 1000   PEAK DATA: 1.45 G @ 3.84 MS; -4.71 G @ 2.40 MS


PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION Z AXIS
TRC TEST NUMBER: 192C27HD4
572E SN192 HEAD DROP CAL 27
RUN NUMBER: 111795.1228;2
75
0
-75
-150
-225
-300
-375
ACCELERATION (G)
-10
0
10
20
30
40
50
60
70
80
90
100
TIME (MS X 10^-1)
CHANNEL: HEDZG
FILTER: CH. CLASS 1000
PEAK DATA: 0.02 G @ -0.08 MS; -129.43 G @ 2.08 MS

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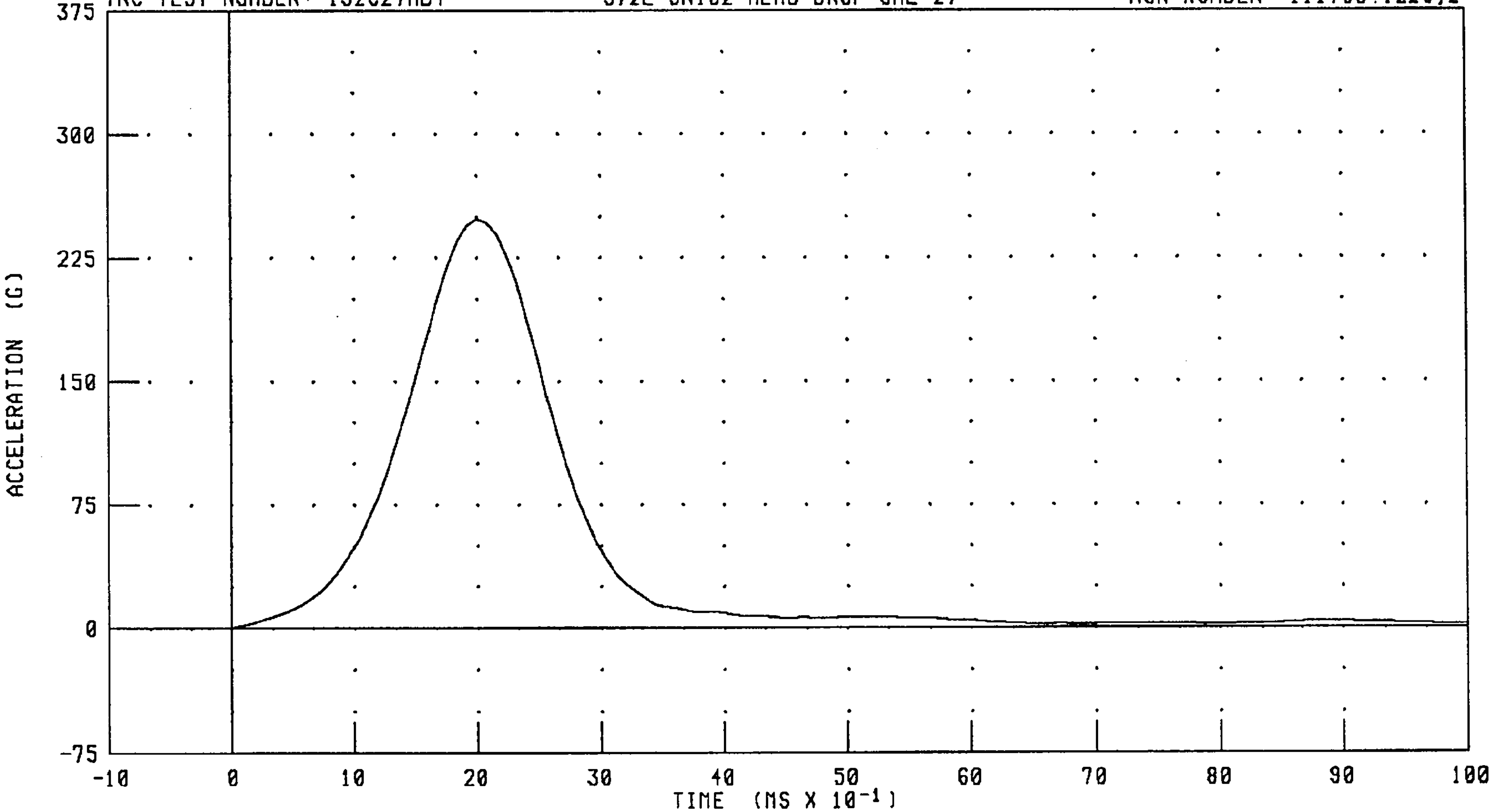
PART 572-E HYBRID III HEAD CALIBRATION
HEAD RESULTANT ACCELERATION

TRC TEST NUMBER: 192C27HD4 572E SN192 HEAD DROP CAL 27 RUN NUMBER: 111795.1228;2



CHANNEL: HEDRG FILTER: CH. CLASS 1000 PEAK DATA: 248.16 G @ 2.00 MS; 0.02 G @ -0.96 MS

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TRANSPORTATION RESEARCH CENTER INC.

NECK FLEXION TEST - 6 CHANNEL TRANSDUCER

HYBRID III 15-SEP-95

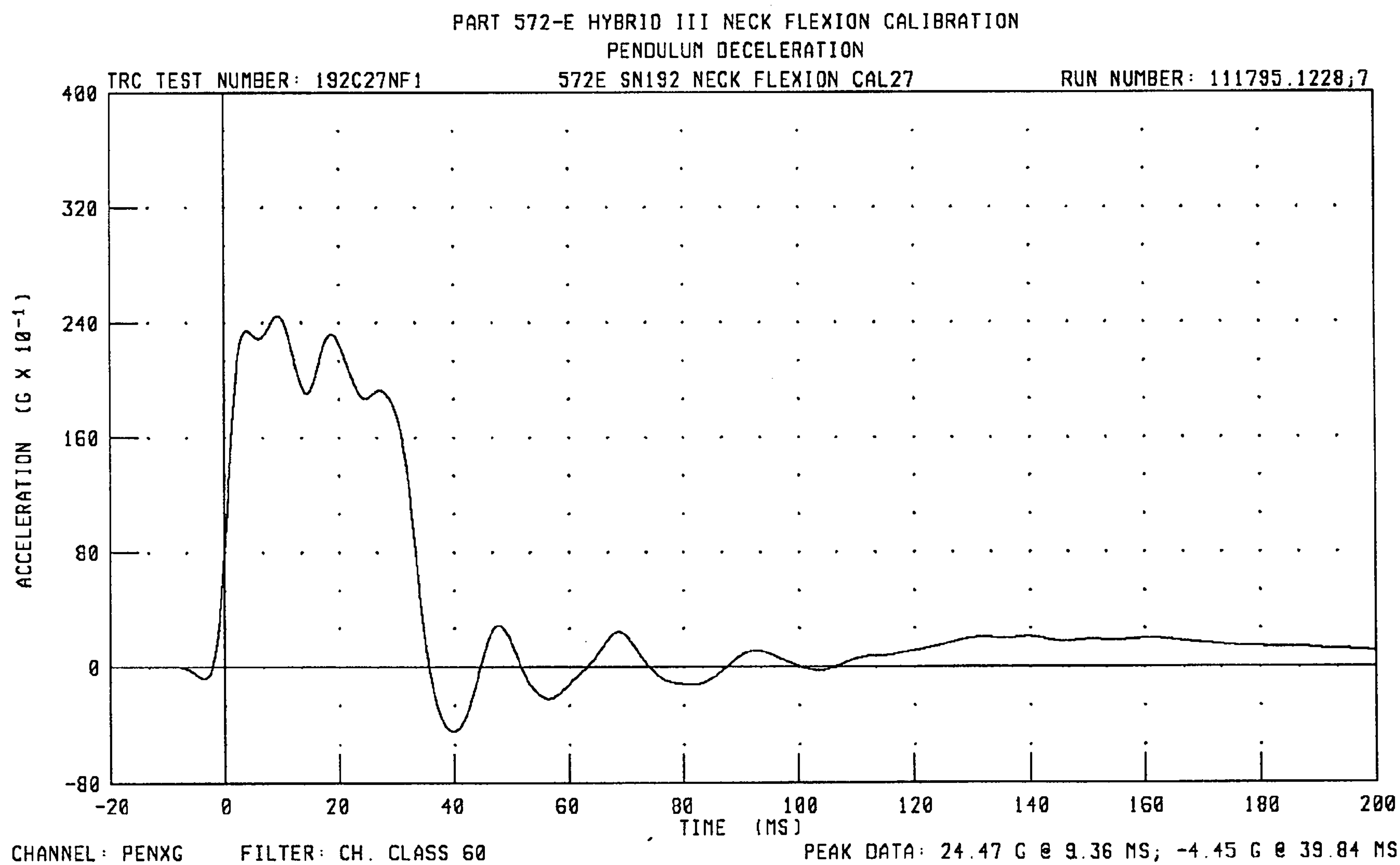
TRC INC. TEST NO: 192C27NF1 572E SN192 NECK FLEXION CAL27

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY		10 - 70 %	62.0 %
IMPACT VELOCITY		6.89 - 7.13 M/S	7.06 M/S
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G	24.27 G
	20 MS	17.60 - 22.60 G	22.59 G
	30 MS	12.50 - 18.50 G	17.66 G
MAX PENDULUM G		29 G MAX	24.47 G
MAX PENDULUM G ABOVE 30 MS		29 G MAX	17.56 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		34 - 42 MS	34.08 MS
D PLANE ROTATION	MAX	64 - 78 DEG.	75.65 DEG.
	TIME	57 - 64 MS	59.60 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88.2 - 108.5 NM	105.61 NM
	TIME	47 - 58 MS	48.08 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	116.72 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	97.36 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN Chas. Middle

RUN NUMBER: 091595.1236;7


PART 572-E HYBRID III NECK FLEXION CALIBRATION
PENDULUM DECELERATION
TRC TEST NUMBER: 192C27NF1
572E SN192 NECK FLEXION CAL27
RUN NUMBER: 111795.1228;7
ACCELERATION (G X 10-1)
400
320
240
160
80
0
-80
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: PENXG
FILTER: CH. CLASS 60
PEAK DATA: 24.47 G @ 9.36 MS; -4.45 G @ 39.84 MS

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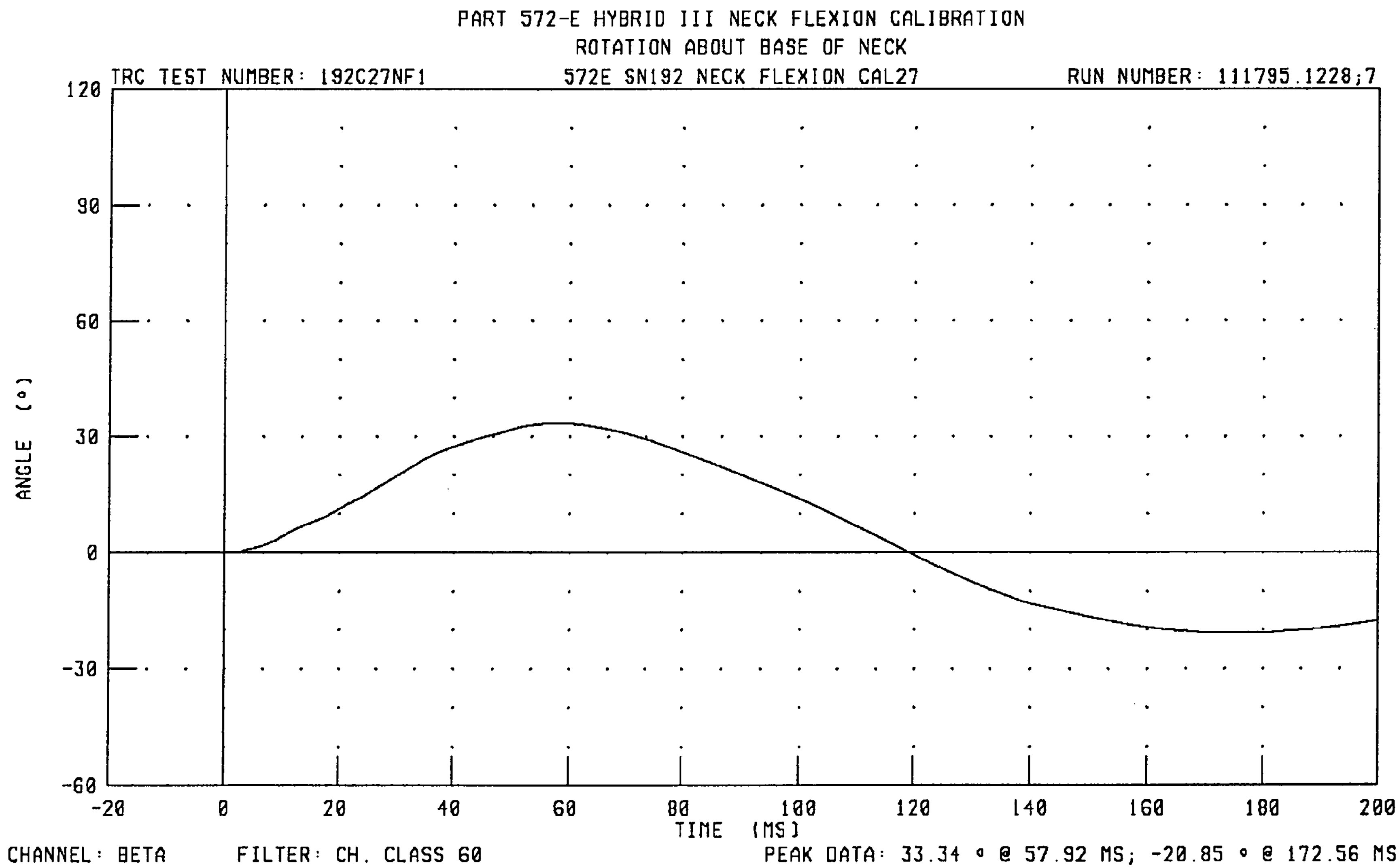

PART 572-E HYBRID III NECK FLEXION CALIBRATION
ROTATION ABOUT BASE OF NECK
TRC TEST NUMBER: 192C27NF1
572E SN192 NECK FLEXION CAL27
RUN NUMBER: 111795.1228;7
ANGLE (°)
120
90
60
30
0
-30
-60
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: BETA
FILTER: CH. CLASS 60
PEAK DATA: 33.34 ° @ 57.92 MS; -20.85 ° @ 172.56 MS

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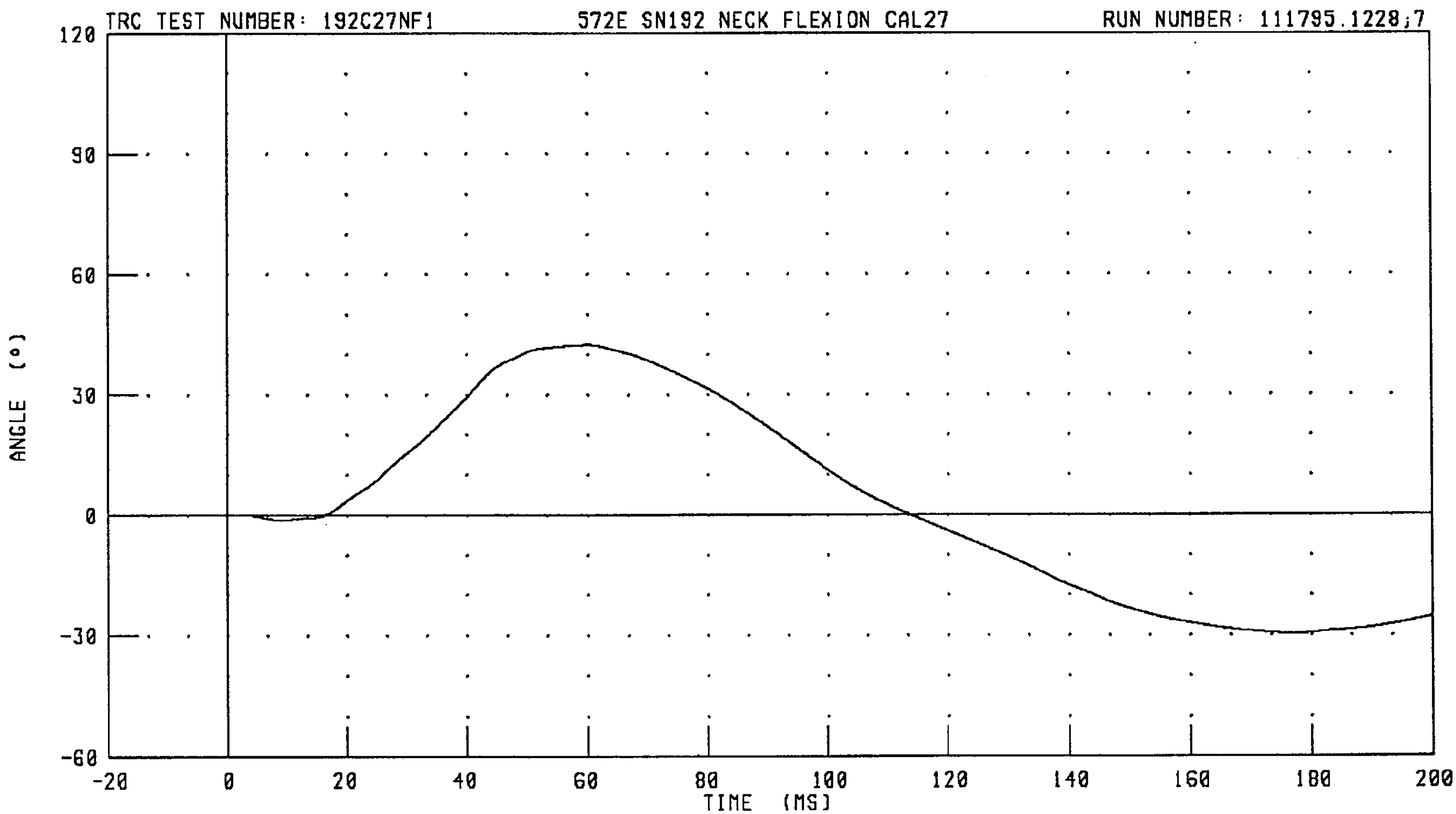
PART 572-E HYBRID III NECK FLEXION CALIBRATION
ROTATION ABOUT OCCIPITAL CONDYLE

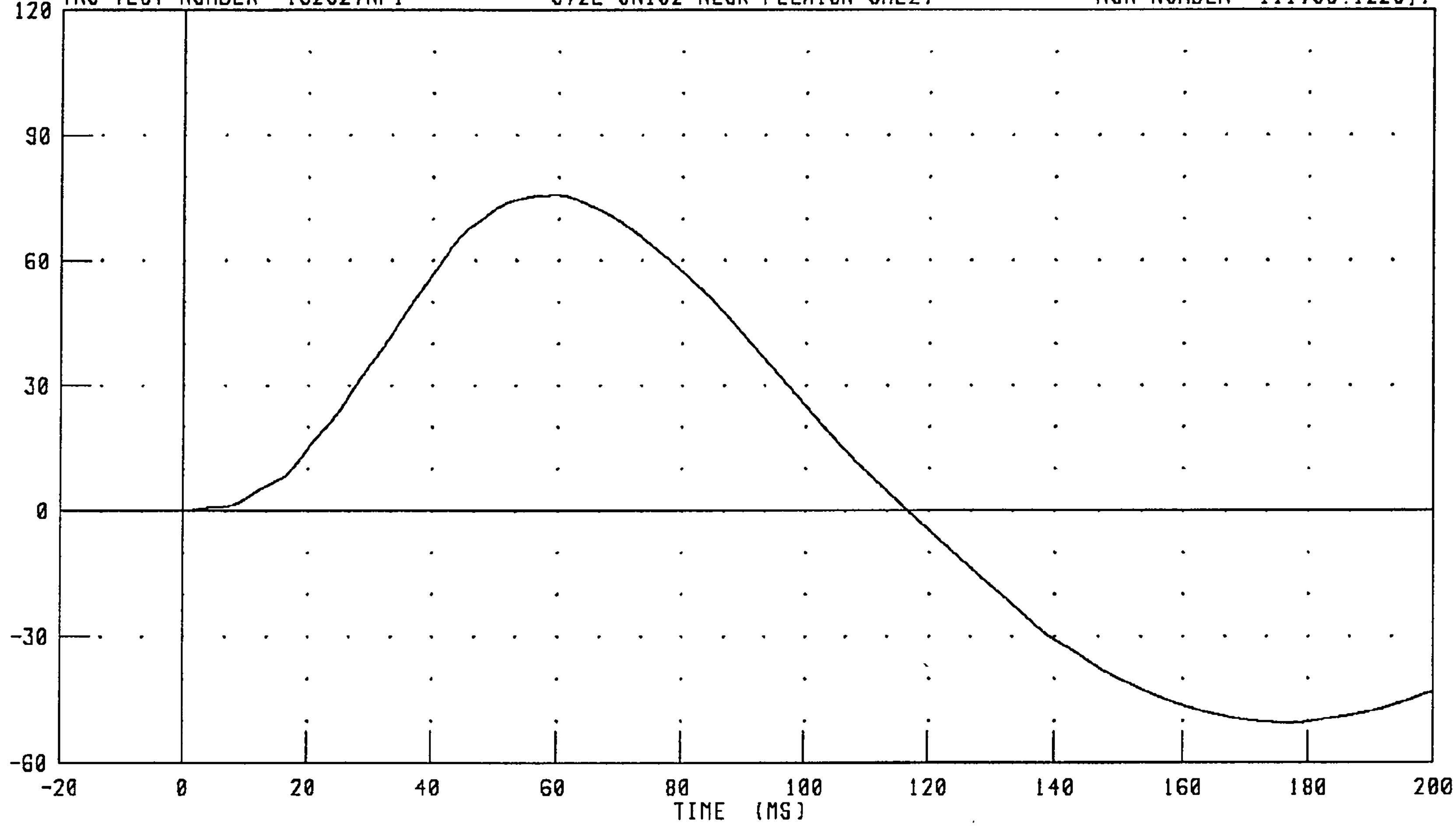


CHANNEL: THETA FILTER: CH. CLASS 60 PEAK DATA: 42.38 ° @ 60.16 MS; -29.63 ° @ 177.04 MS

PART 572-E HYBRID III NECK FLEXION CALIBRATION

TOTAL ROTATION

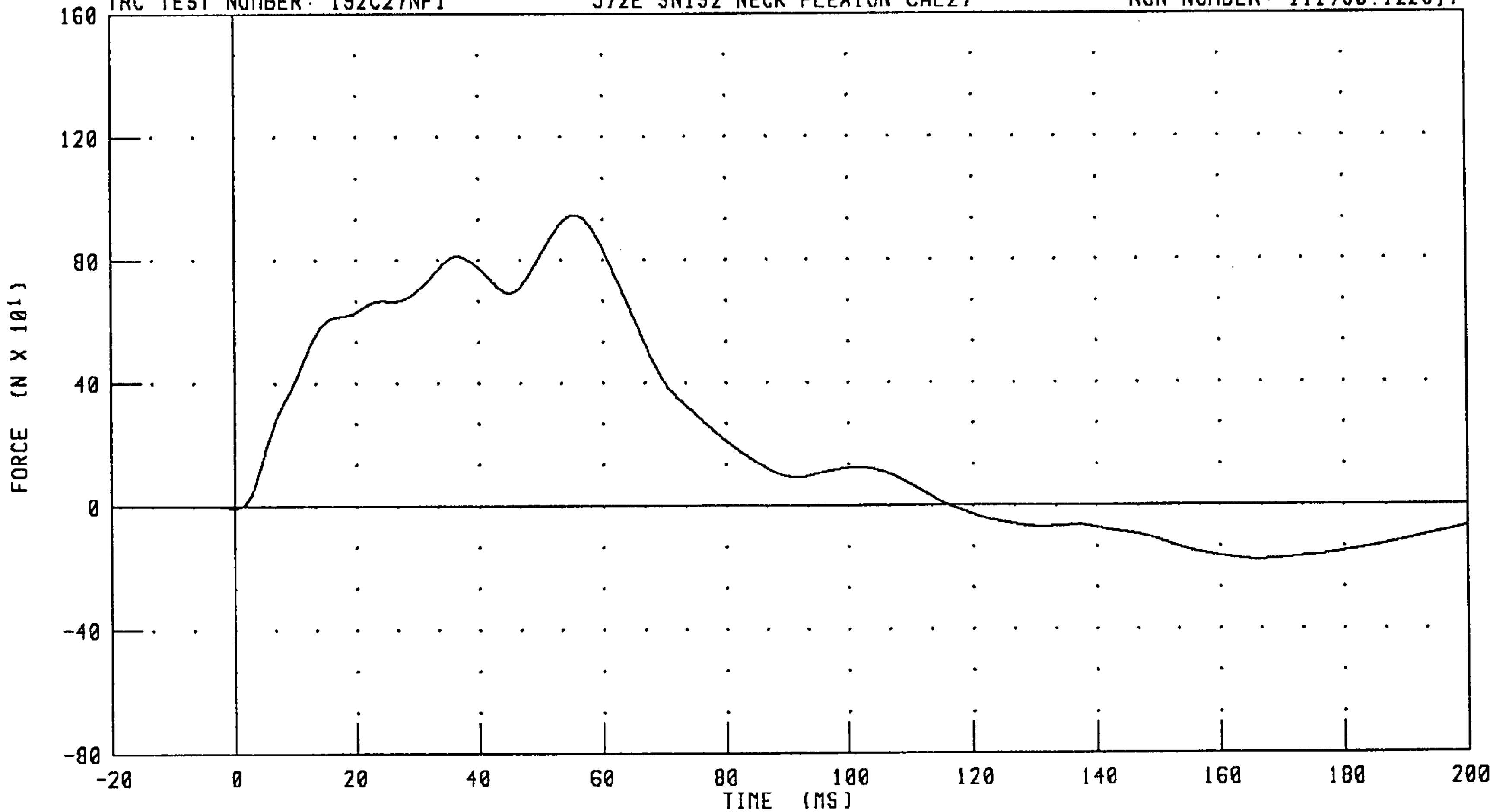
TRC TEST NUMBER: 192C27NF1 572E SN192 NECK FLEXION CAL27 RUN NUMBER: 111795.1228;7



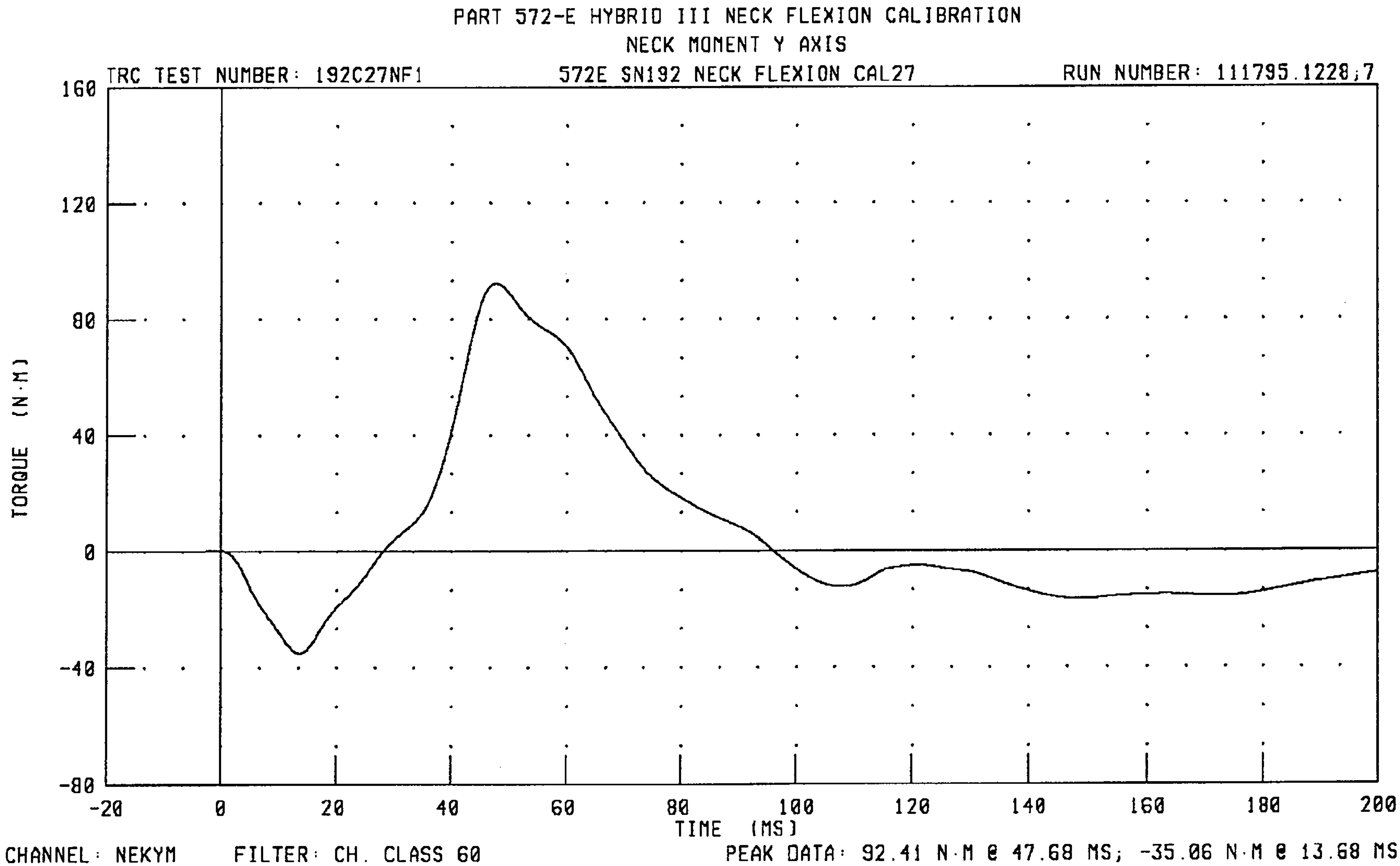
CHANNEL: TOTAN FILTER: CH. CLASS 60 PEAK DATA: 75.66 ° @ 59.60 MS; -50.47 ° @ 177.20 MS

PART 572-E HYBRID III NECK FLEXION CALIBRATION
NECK FORCE X AXIS

TRC TEST NUMBER: 192C27NF1 572E SN192 NECK FLEXION CAL27 RUN NUMBER: 111795.1228;7

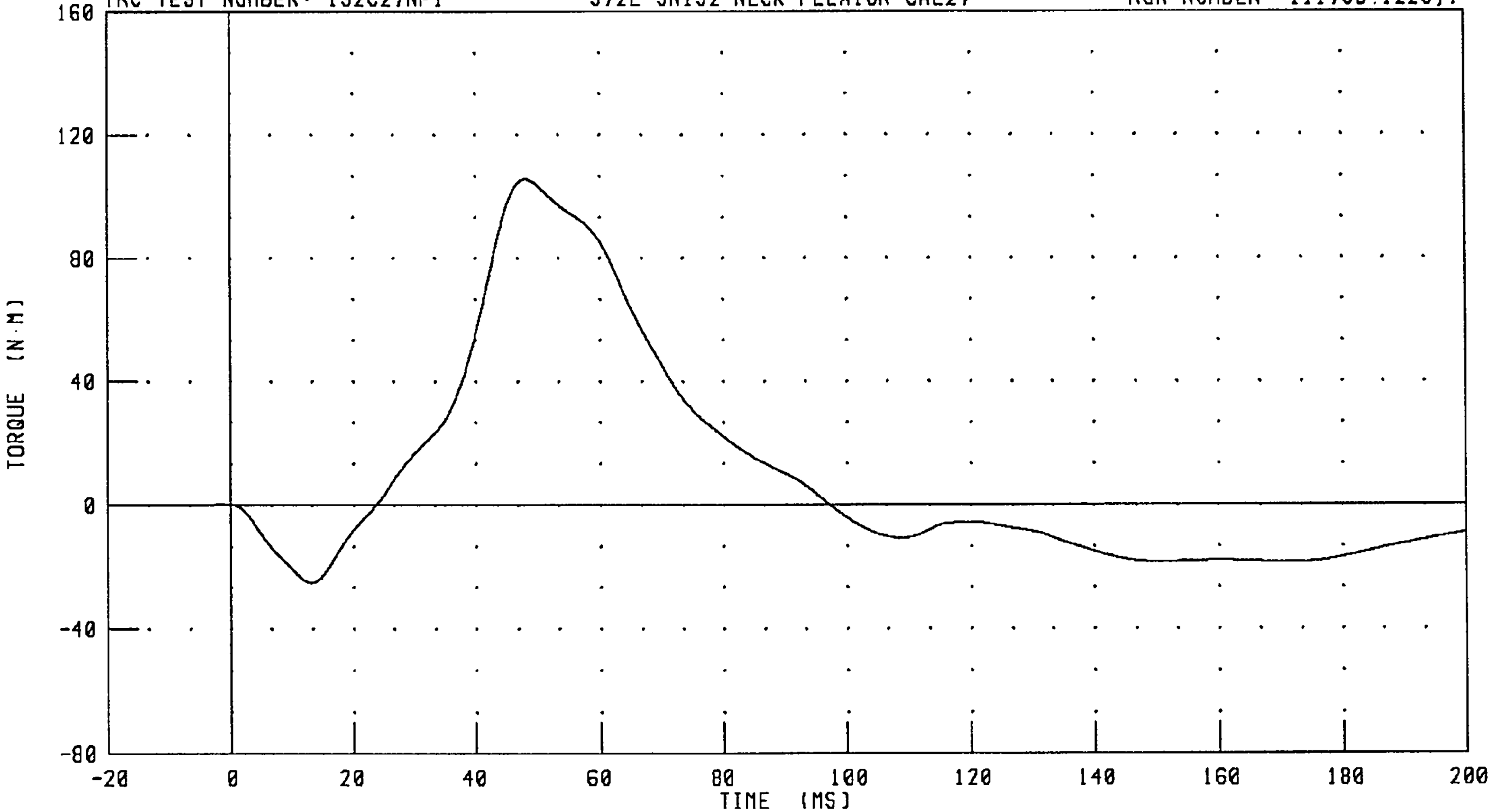


CHANNEL: NEKXF FILTER: CH. CLASS 60 PEAK DATA: 946.07 N @ 55.60 MS; -178.11 N @ 166.24 MS


PART 572-E HYBRID III NECK FLEXION CALIBRATION
NECK MOMENT Y AXIS
TRC TEST NUMBER: 192C27NF1
572E SN192 NECK FLEXION CAL27
RUN NUMBER: 111795.1228;7
TORQUE (N·M)
160
120
80
40
0
-40
-80
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: NEKYM
FILTER: CH. CLASS 60
PEAK DATA: 92.41 N·M @ 47.68 MS; -35.06 N·M @ 13.68 MS

PART 572-E HYBRID III NECK FLEXION CALIBRATION
TOTAL MOMENT ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER: 192C27NF1 572E SN192 NECK FLEXION CAL27 RUN NUMBER: 111795.1228;7



CHANNEL: NEKOM FILTER: CH. CLASS 60 PEAK DATA: 105.61 N·M @ 48.08 MS; -25.17 N·M @ 13.20 MS

TRANSPORTATION RESEARCH CENTER INC.

NECK EXTENSION TEST - 6 CHANNEL TRANSDUCER

HYBRID III 13-SEP-95

TRC INC. TEST NO: 192C27NE1 572E SN192 NECK EXT. CAL27

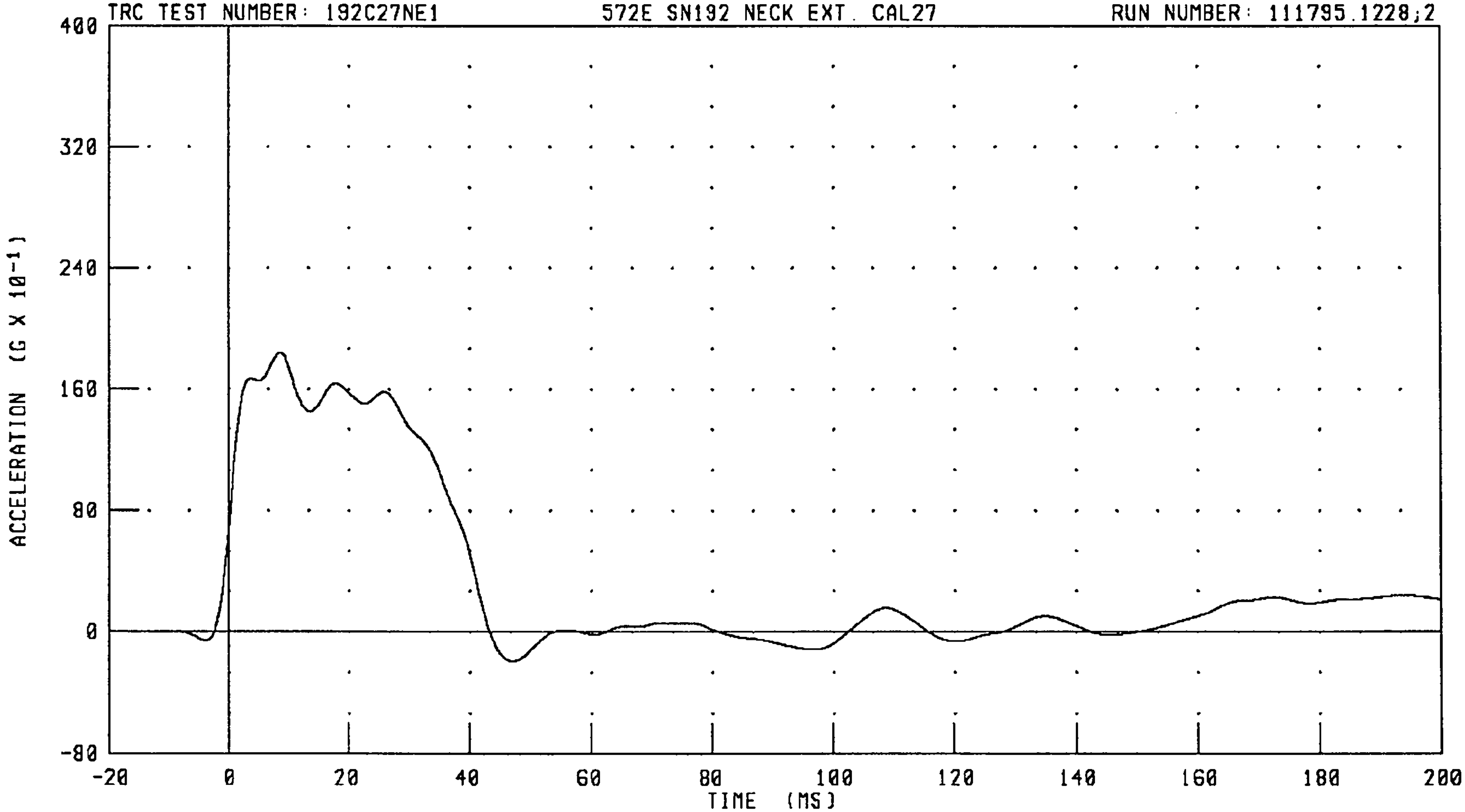
TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6 - 22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY		10 - 70 %	62.0 %
IMPACT VELOCITY		5.95 - 6.19 M/S	6.00 M/S
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G	17.52 G
	20 MS	14.00 - 19.00 G	15.78 G
	30 MS	11.00 - 16.00 G	13.46 G
MAX PENDULUM G		22 G MAX	18.40 G
MAX PENDULUM G ABOVE 30 MS		22 G MAX	13.42 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		38 - 46 MS	40.08 MS
D PLANE ROTATION	MAX	81 - 106 DEG.	100.66 DEG.
	TIME	72 - 82 MS	76.48 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MIN	-80.0/-52.9 NM	-72.70 NM
	TIME	65 - 79 MS	71.92 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	161.52 MS
NEGATIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	136.56 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN Chas. Middlel RUN NUMBER: 091595.1355;2

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
PENDULUM DECELERATION

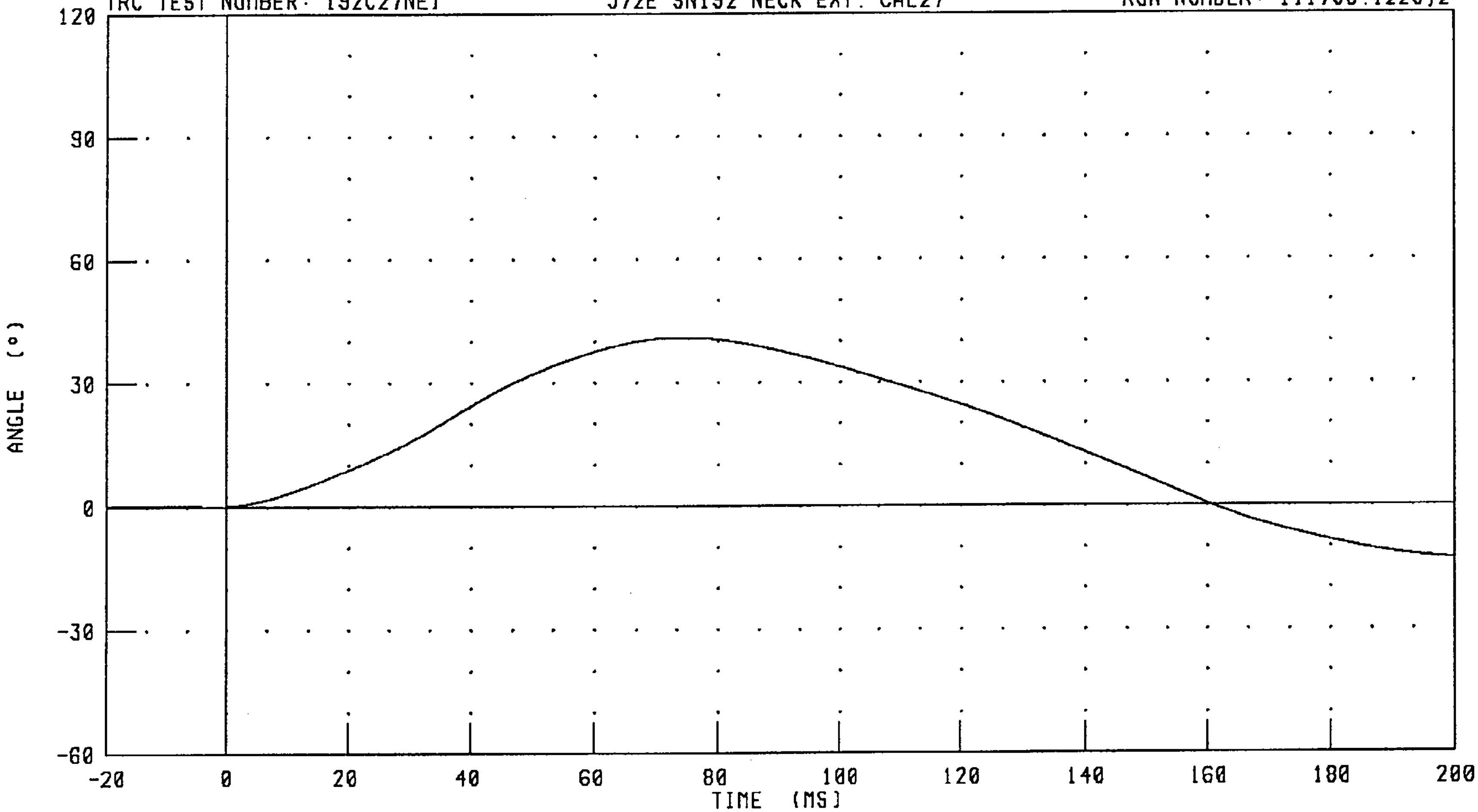
TRC TEST NUMBER: 192C27NE1 572E SN192 NECK EXT. CAL27 RUN NUMBER: 111795.1228;2



CHANNEL: PENXG FILTER: CH. CLASS 60 PEAK DATA: 18.41 G @ 8.64 MS; -1.94 G @ 47.12 MS

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
ROTATION ABOUT BASE OF NECK

TRC TEST NUMBER: 192C27NE1 572E SN192 NECK EXT. CAL27 RUN NUMBER: 111795.1228;2

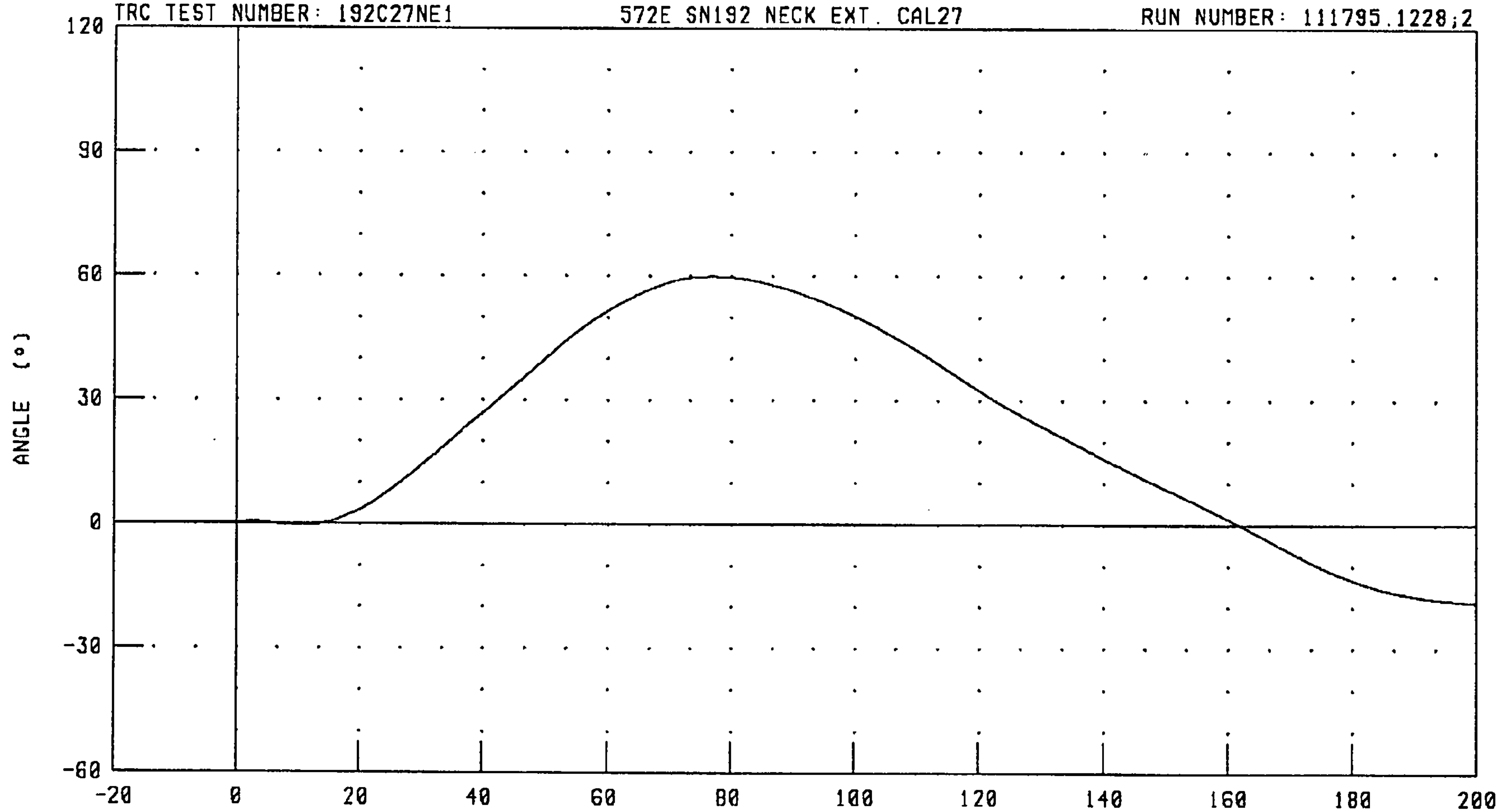


CHANNEL: BETA FILTER: CH. CLASS 60 PEAK DATA: 40.81 ° @ 74.88 MS; -12.91 ° @ 200.00 MS

951101

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
ROTATION ABOUT OCCIPITAL CONDYLE

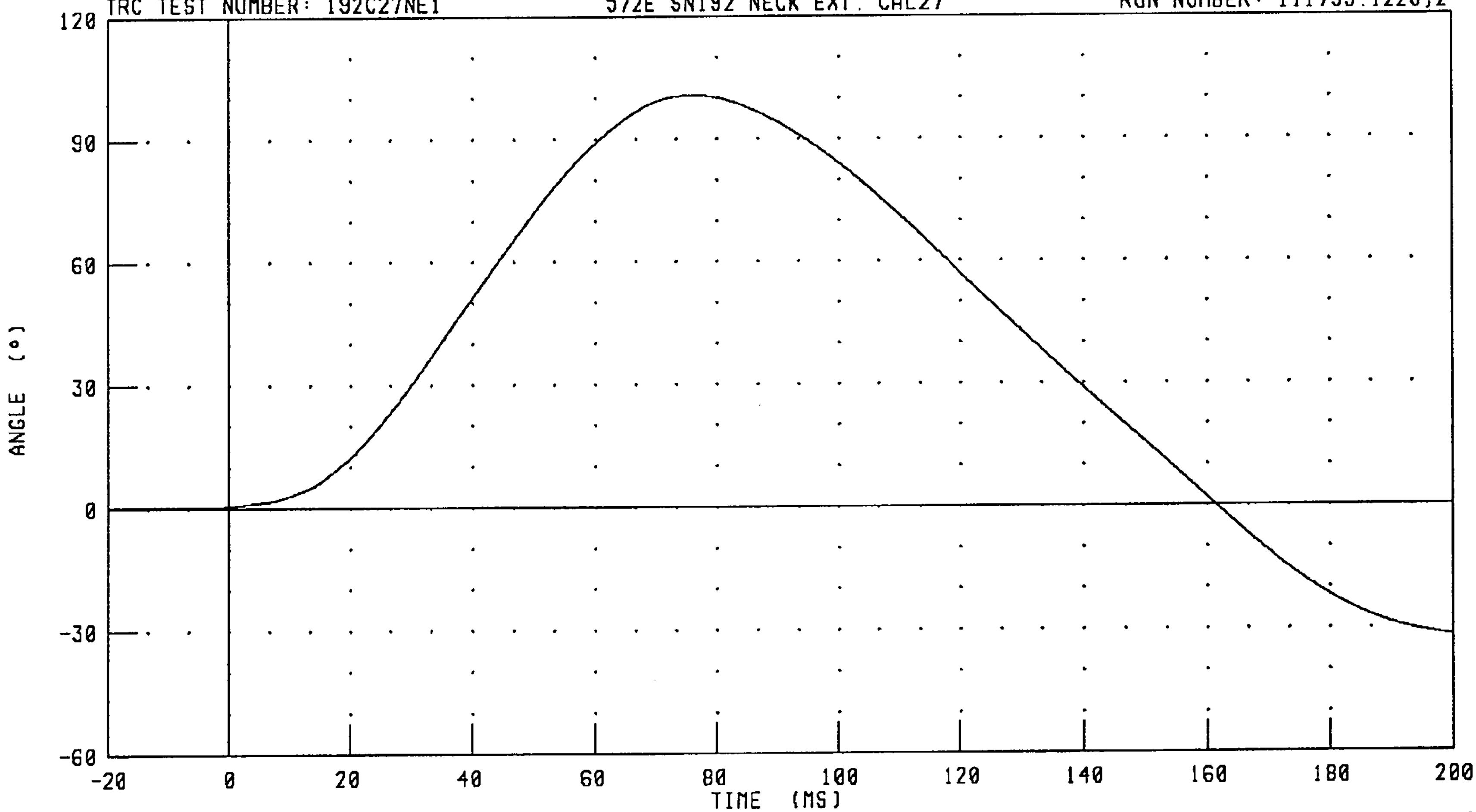
TRC TEST NUMBER: 192C27NE1 572E SN192 NECK EXT. CAL27 RUN NUMBER: 111795.1228;2



CHANNEL: THETA FILTER: CH. CLASS 60 PEAK DATA: 59.88 ° @ 77.12 MS; -18.90 ° @ 200.00 MS

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
TOTAL ROTATION

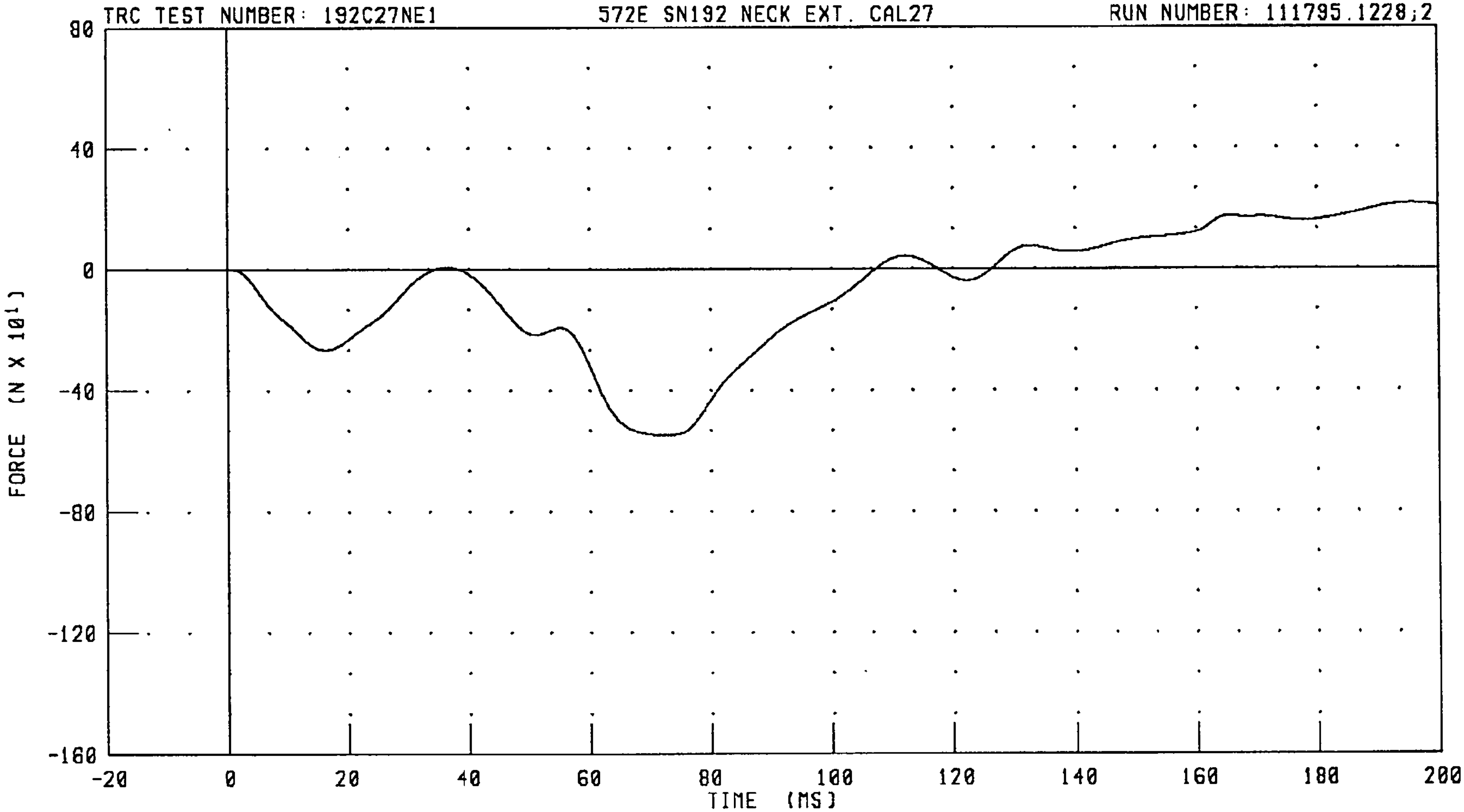
TRC TEST NUMBER: 192C27NE1 572E SN192 NECK EXT. CAL27 RUN NUMBER: 111795.1228;2



CHANNEL: TOTAN FILTER: CH. CLASS 60 PEAK DATA: 100.66 ° @ 76.48 MS; -31.80 ° @ 200.00 MS

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
NECK FORCE X AXIS

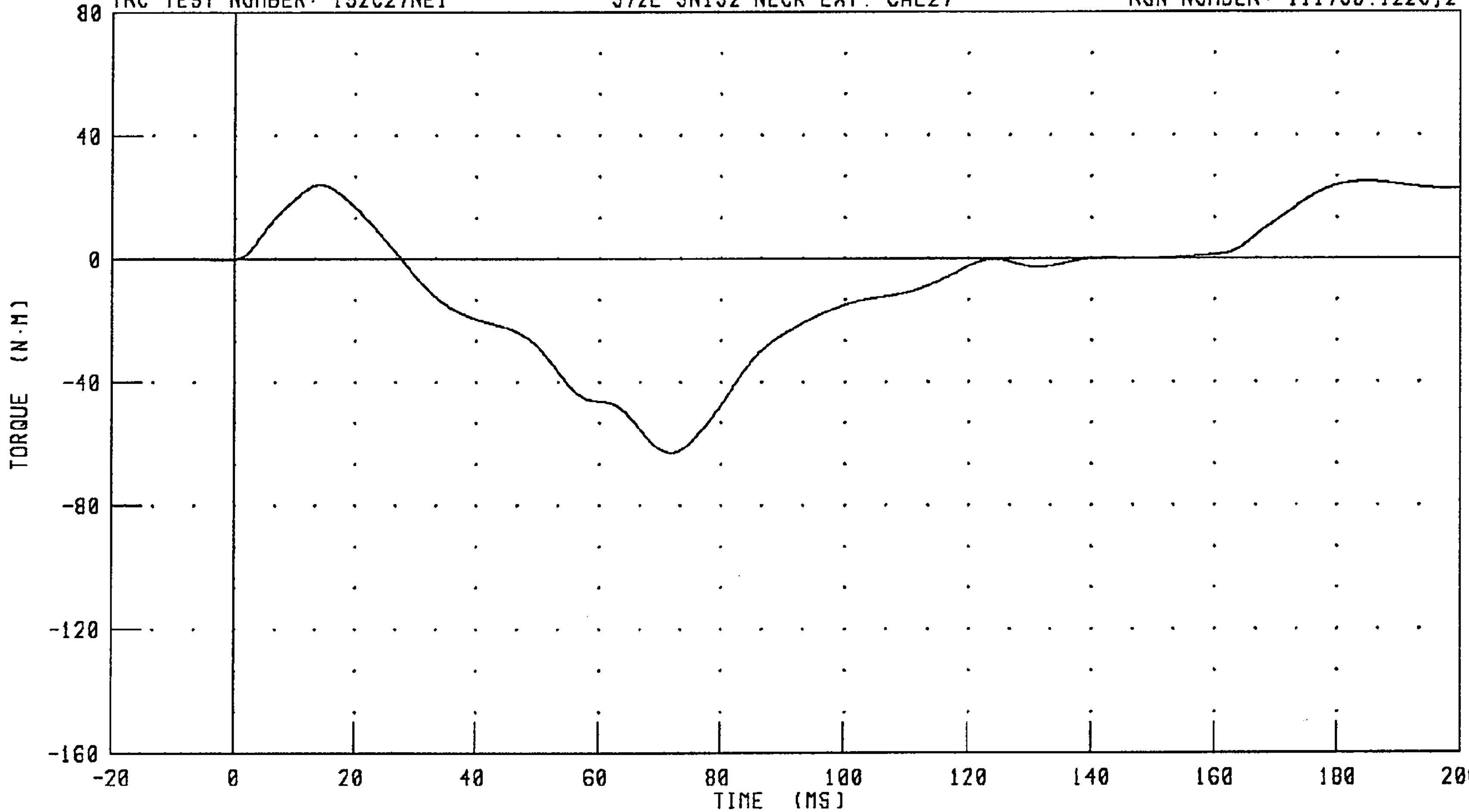
TRC TEST NUMBER: 192C27NE1 572E SN192 NECK EXT. CAL27 RUN NUMBER: 111795.1228;2



CHANNEL: NEKXF FILTER: CH. CLASS 60 PEAK DATA: 214.90 N @ 195.76 MS; -548.25 N @ 72.40 MS

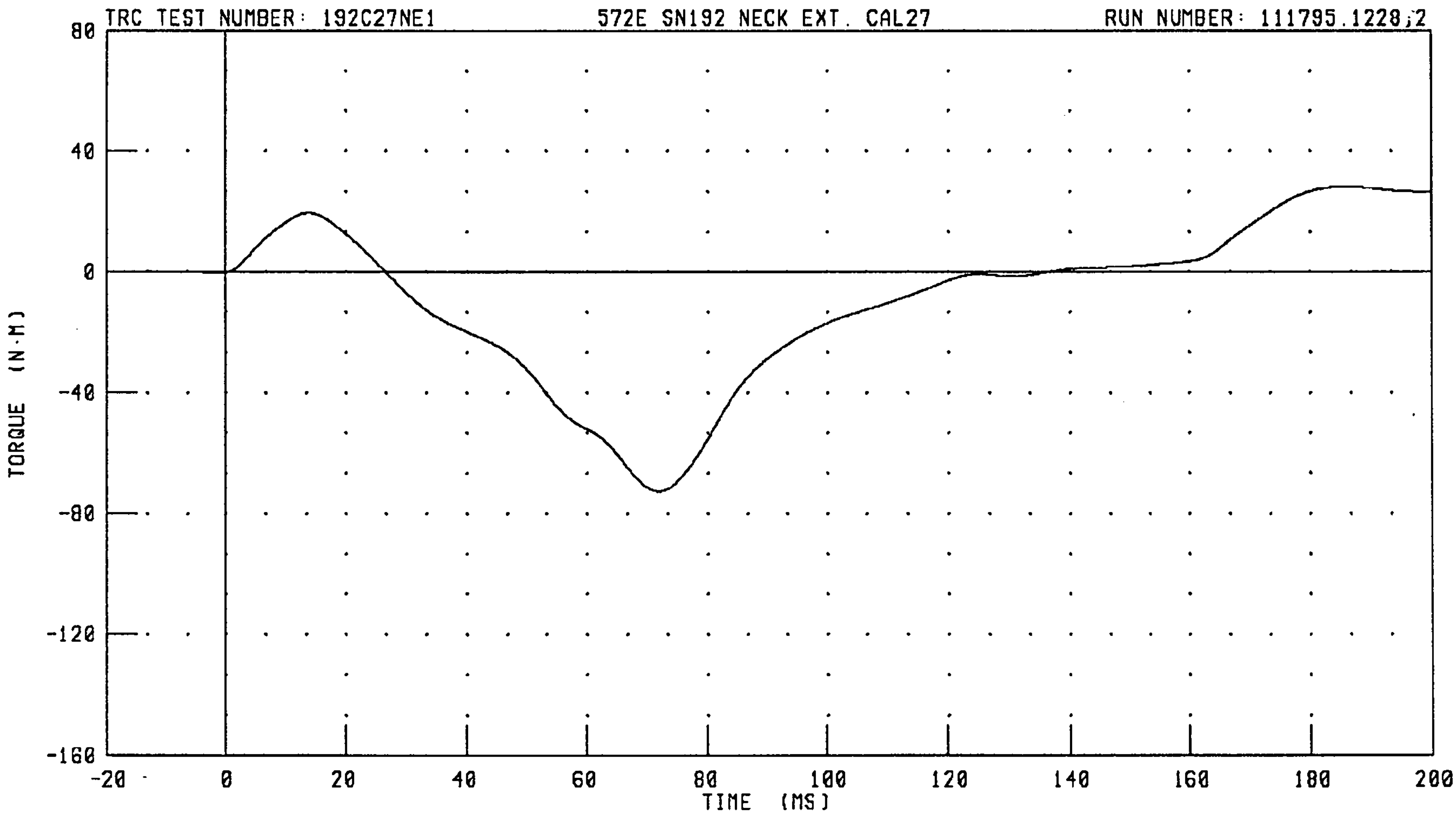
PART 572-E HYBRID III NECK EXTENSION CALIBRATION
NECK MOMENT Y AXIS

TRC TEST NUMBER: 192C27NE1 572E SN192 NECK EXT. CAL27 RUN NUMBER: 111795.1228;2



CHANNEL: NEKYM FILTER: CH. CLASS 60 PEAK DATA: 24.99 N·M @ 184.96 MS; -62.95 N·M @ 71.92 MS

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
TOTAL MOMENT ABOUT OCCIPITAL CONDYLE



CHANNEL: NEKOM FILTER: CH. CLASS 60 PEAK DATA: 28.20 N·M @ 186.00 MS; -72.70 N·M @ 71.92 MS

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

HYBRID III 15-SEP-95

TRC INC. TEST NO: 192C27TH1 572E SN192 H.S.THORAX CAL27

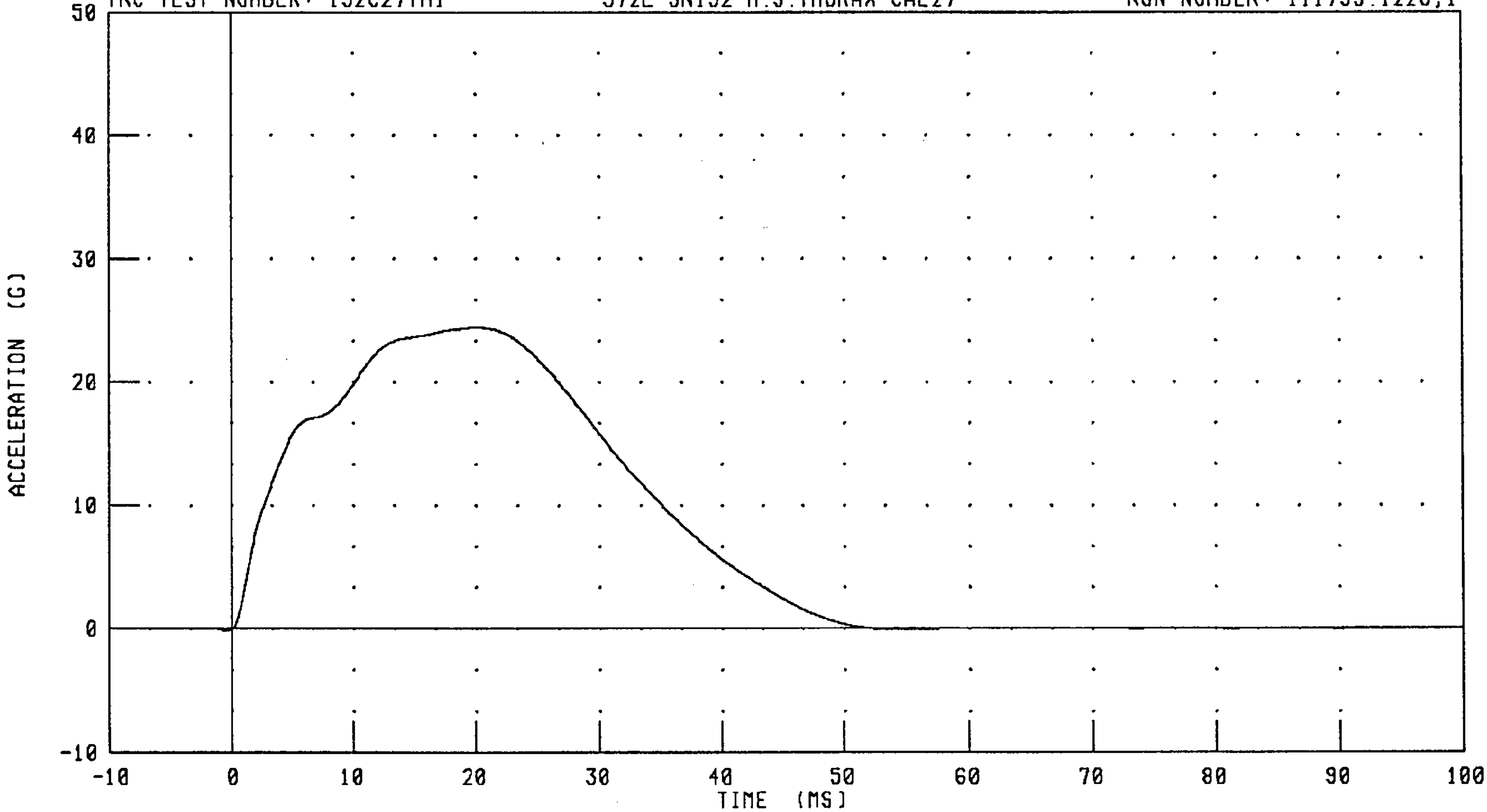
TEST PARAMETER	HIGH SPEED TEST SPECIFICATION	TEST RESULTS
TEMPERATURE	20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	62.0 %
PENDULUM VELOCITY	6.59 - 6.83 M/S	6.65 M/S
MAXIMUM DEFLECTION	63.5 - 72.6 MM	67.1 MM
MAXIMUM RESISTIVE FORCE	5159 - 5894 N	5589. N
INTERNAL HYSTERESIS	69% - 85%	71.5%

TEST MEETS SPECIFICATIONS

TECHNICIAN Chas Mitchell RUN NUMBER: 091595.1513;1

PART 572-E HYBRID III THORAX CALIBRATION
PENDULUM DECELERATION

TRC TEST NUMBER: 192C27TH1   572E SN192 H.S.THORAX CAL27   RUN NUMBER: 111795.1228;1



CHANNEL: PENXG   FILTER: CH. CLASS 180   PEAK DATA: 24.40 G @ 20.16 MS; -0.14 G @ -0.40 MS

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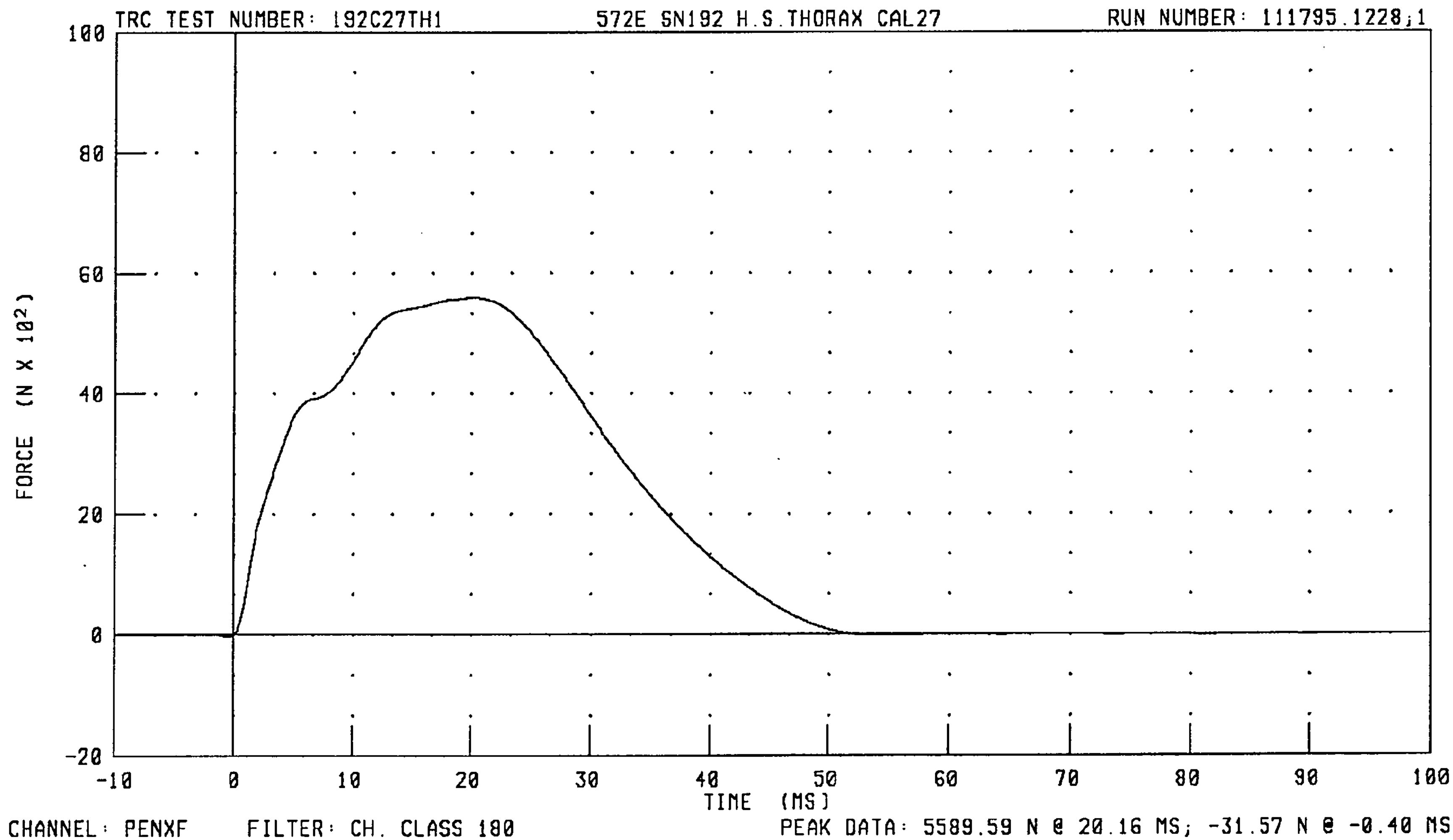
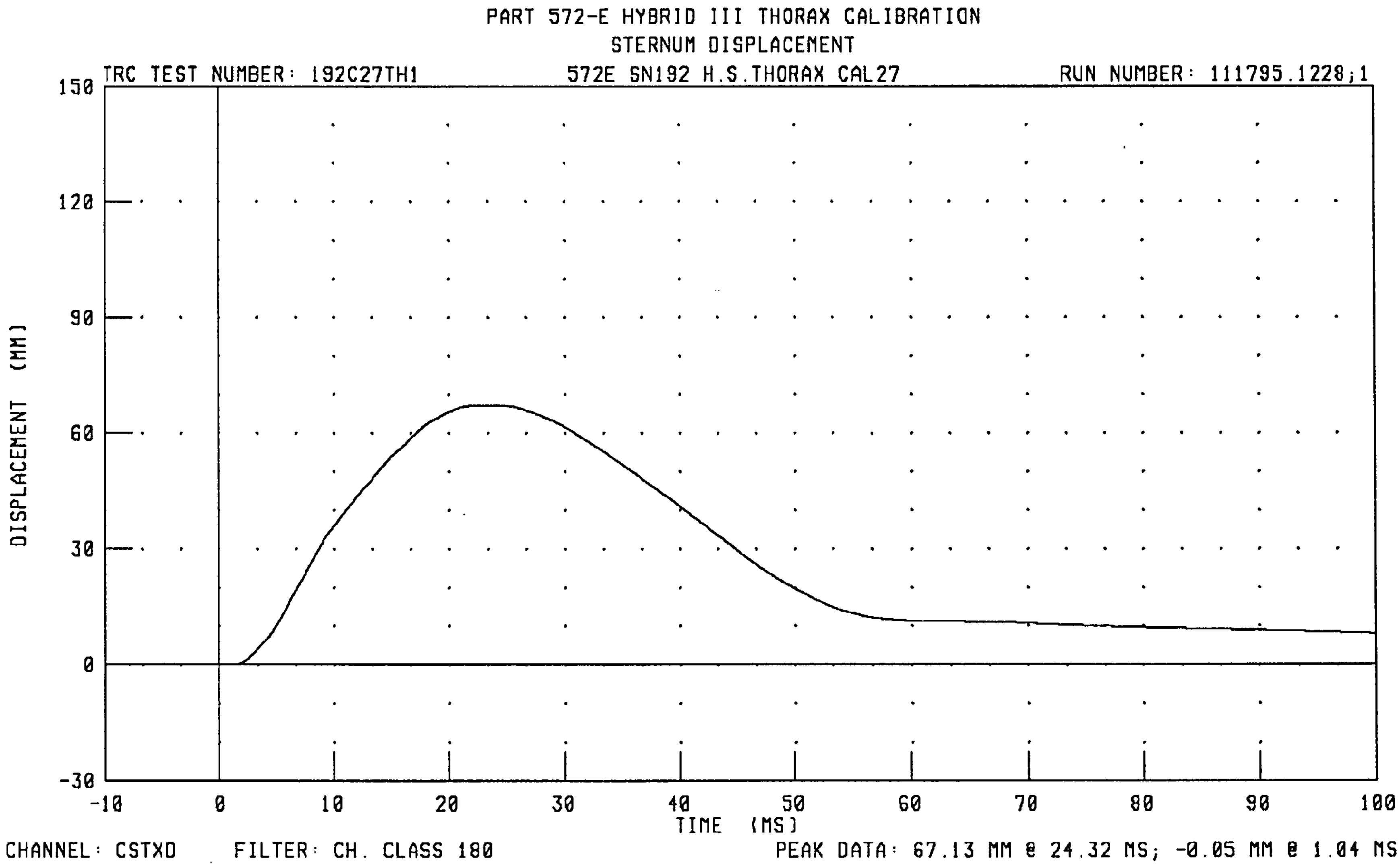
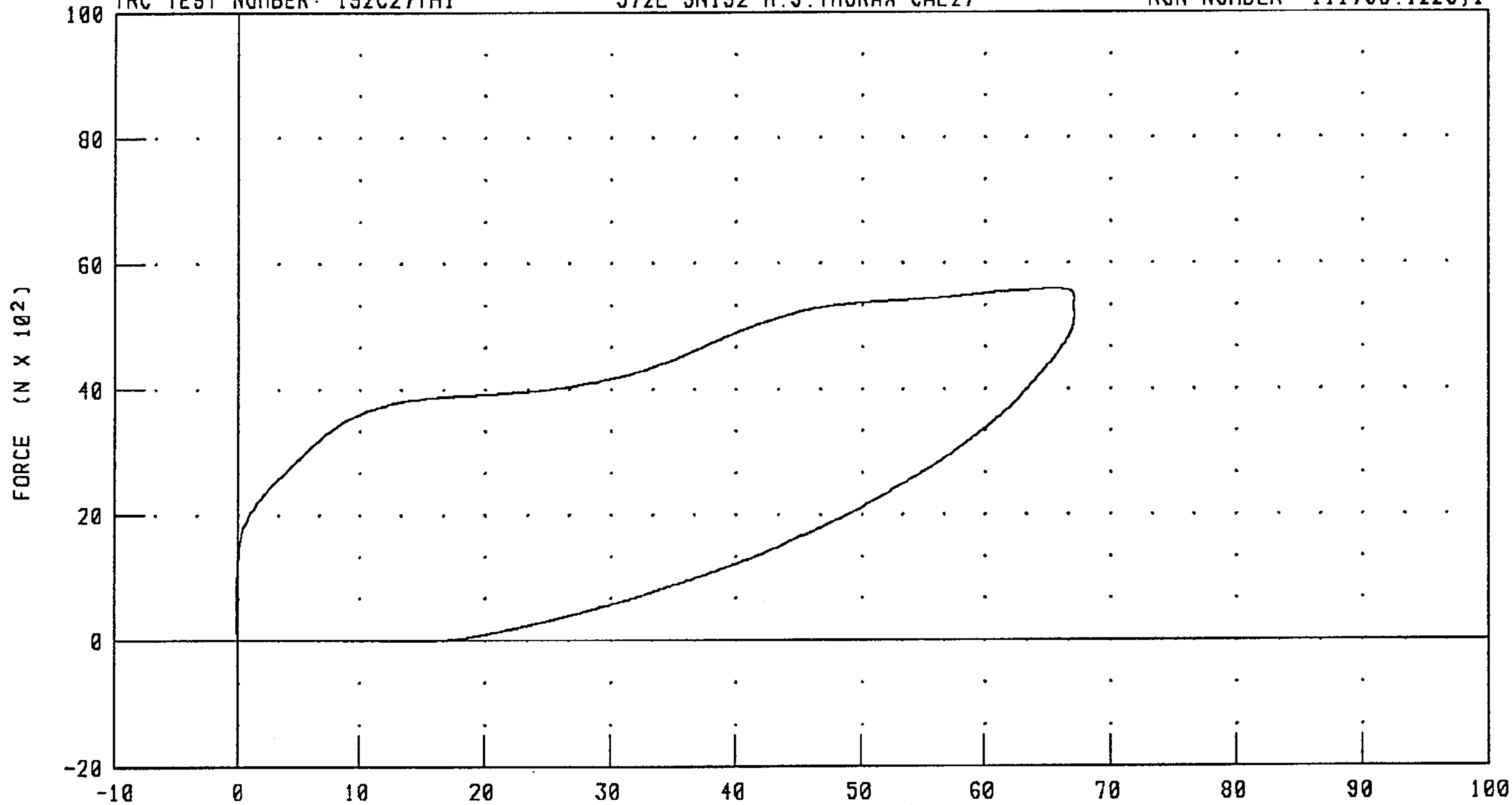
PART 572-E HYBRID III THORAX CALIBRATION
PENDULUM FORCE




PART 572-E HYBRID III THORAX CALIBRATION
STERNUM DISPLACEMENT
TRC TEST NUMBER: 192C27TH1
572E SN192 H.S.THORAX CAL27
RUN NUMBER: 111795.1228;1
150
120
90
60
30
0
-30
DISPLACEMENT (MM)
-10
0
10
20
30
40
50
60
70
80
90
100
TIME (MS)
CHANNEL: CSTXD
FILTER: CH. CLASS 180
PEAK DATA: 67.13 MM @ 24.32 MS; -0.05 MM @ 1.04 MS

PART 572-E HYBRID III THORAX CALIBRATION
CHEST DISPLACEMENT VS PENDULUM FORCE

TRC TEST NUMBER: 192C27TH1 572E SN192 H.S.THORAX CAL27 RUN NUMBER: 111795.1228;1



CHANNEL: CSTXD FILTER: CH. CLASS 180
PENXF CH. CLASS 180

PEAK DATA: 67.13 MM @ 24.32 MS; -0.05 MM @ 1.04 MS
5589.59 N @ 20.16 MS; -31.57 N @ -0.40 MS

TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

HYBRID III 13-SEP-95

TRC INC. TEST NO: 192C27RK1 572E SN192 RIGHT KNEE CAL 27

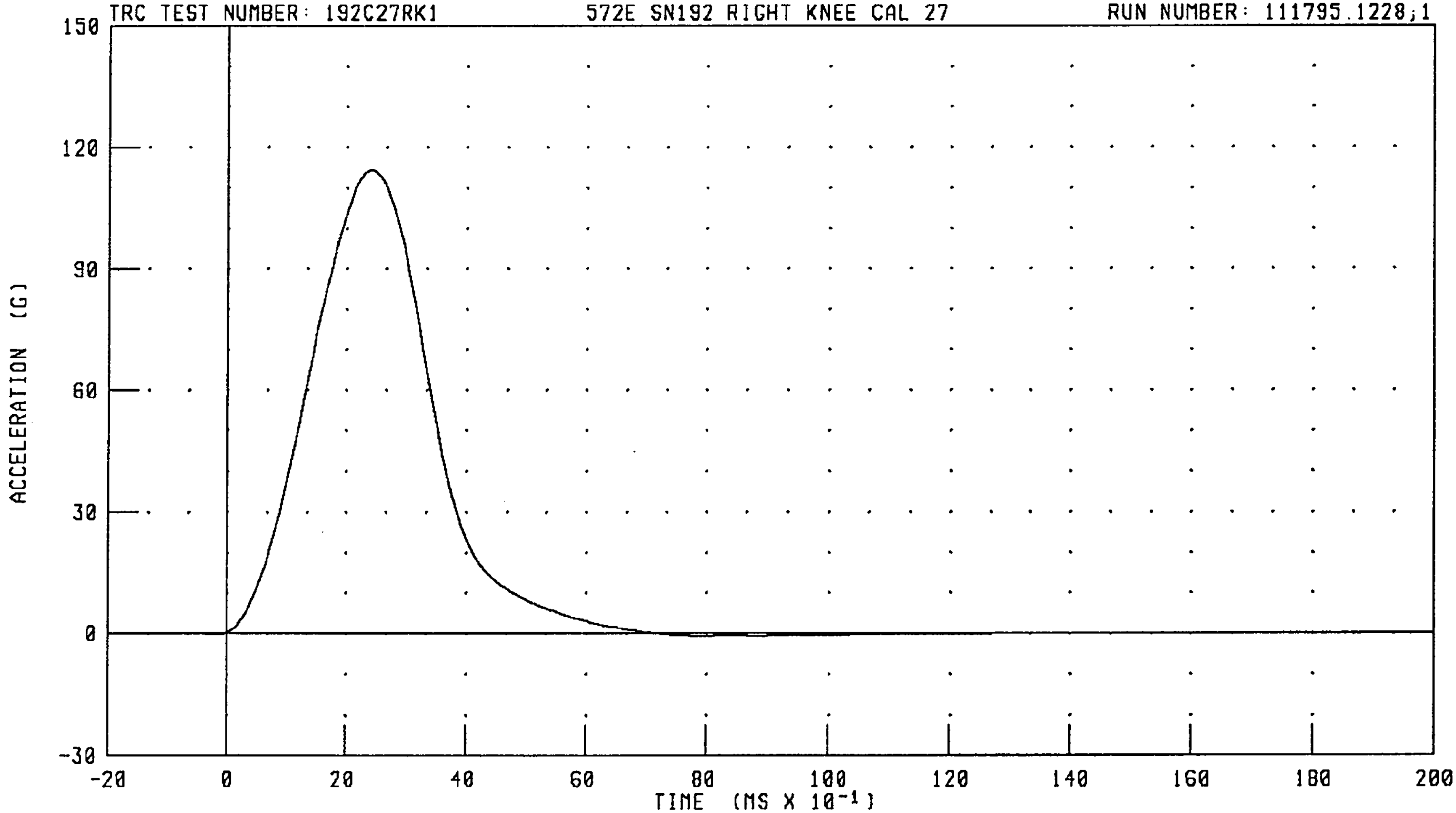
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	20.6 DEG. C
RELATIVE HUMIDITY	10 - 70 %	60.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.11 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	5596.0 N

TEST MEETS SPECIFICATIONS

TECHNICIAN Chas. Mitchell RUN NUMBER: 091395.1342;1

PART 572-E HYBRID III RIGHT KNEE CALIBRATION
PENDULUM DECELERATION (5 KG PEND.)

TRC TEST NUMBER: 192C27RK1 572E SN192 RIGHT KNEE CAL 27 RUN NUMBER: 111795.1228;1



CHANNEL: PENXG FILTER: CH. CLASS 600 PEAK DATA: 114.37 G @ 2.40 MS; -0.59 G @ 8.88 MS

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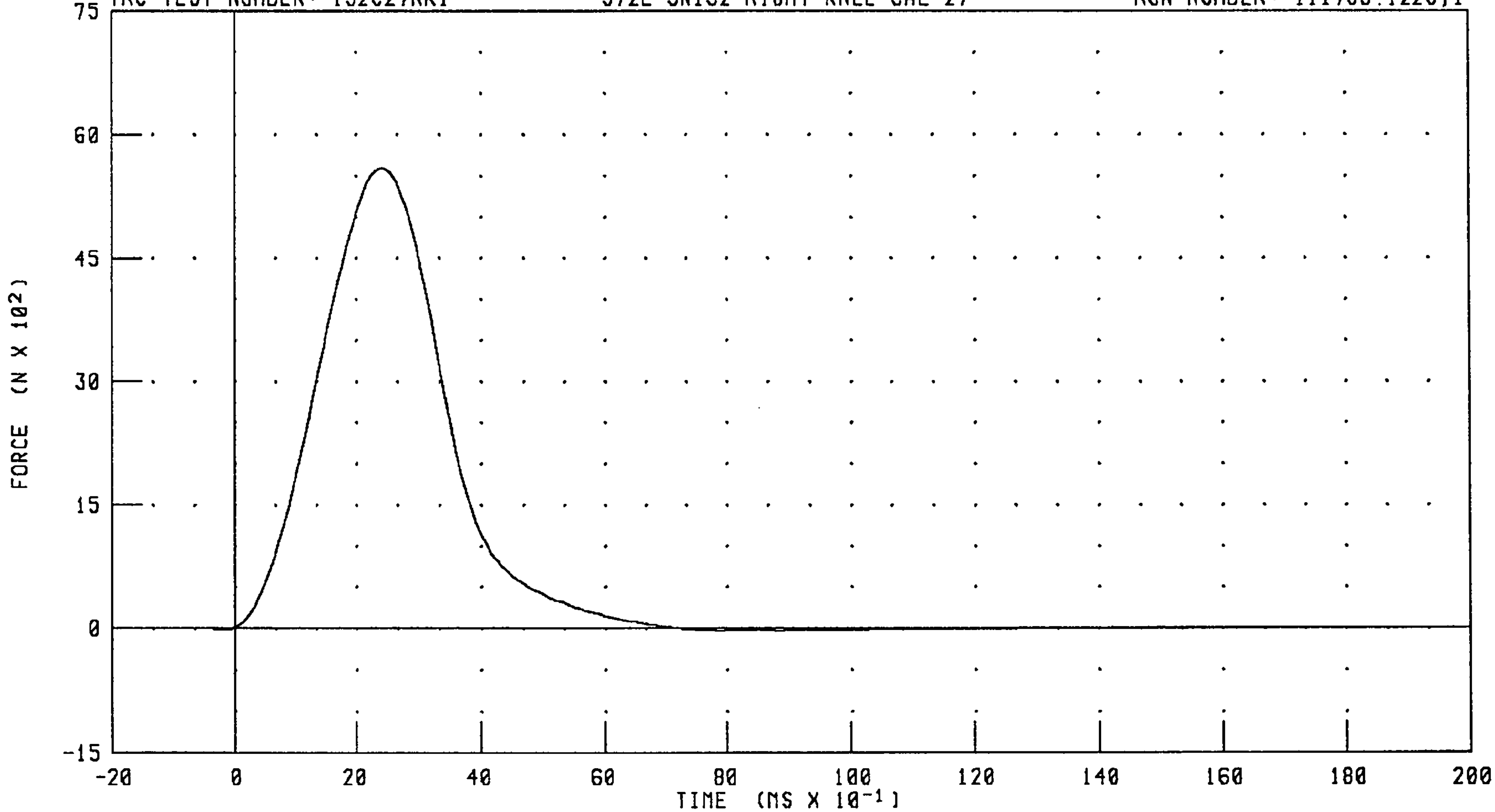
PART 572-E HYBRID III RIGHT KNEE CALIBRATION
PENDULUM FORCE (5 KG PEND.)

TRC TEST NUMBER: 192C27RK1 | 572E SN192 RIGHT KNEE CAL 27 | RUN NUMBER: 111795.1228;1



CHANNEL: PENXF FILTER: CH. CLASS 600 PEAK DATA: 5596.10 N @ 2.40 MS; -28.72 N @ 8.88 MS

TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

HYBRID III 13-SEP-95

TRC INC. TEST NO: 192C27LK1 572E SN192 LEFT KNEE CAL 27

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	20.6 DEG. C
RELATIVE HUMIDITY	10 - 70 %	60.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.11 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	5262.5 N

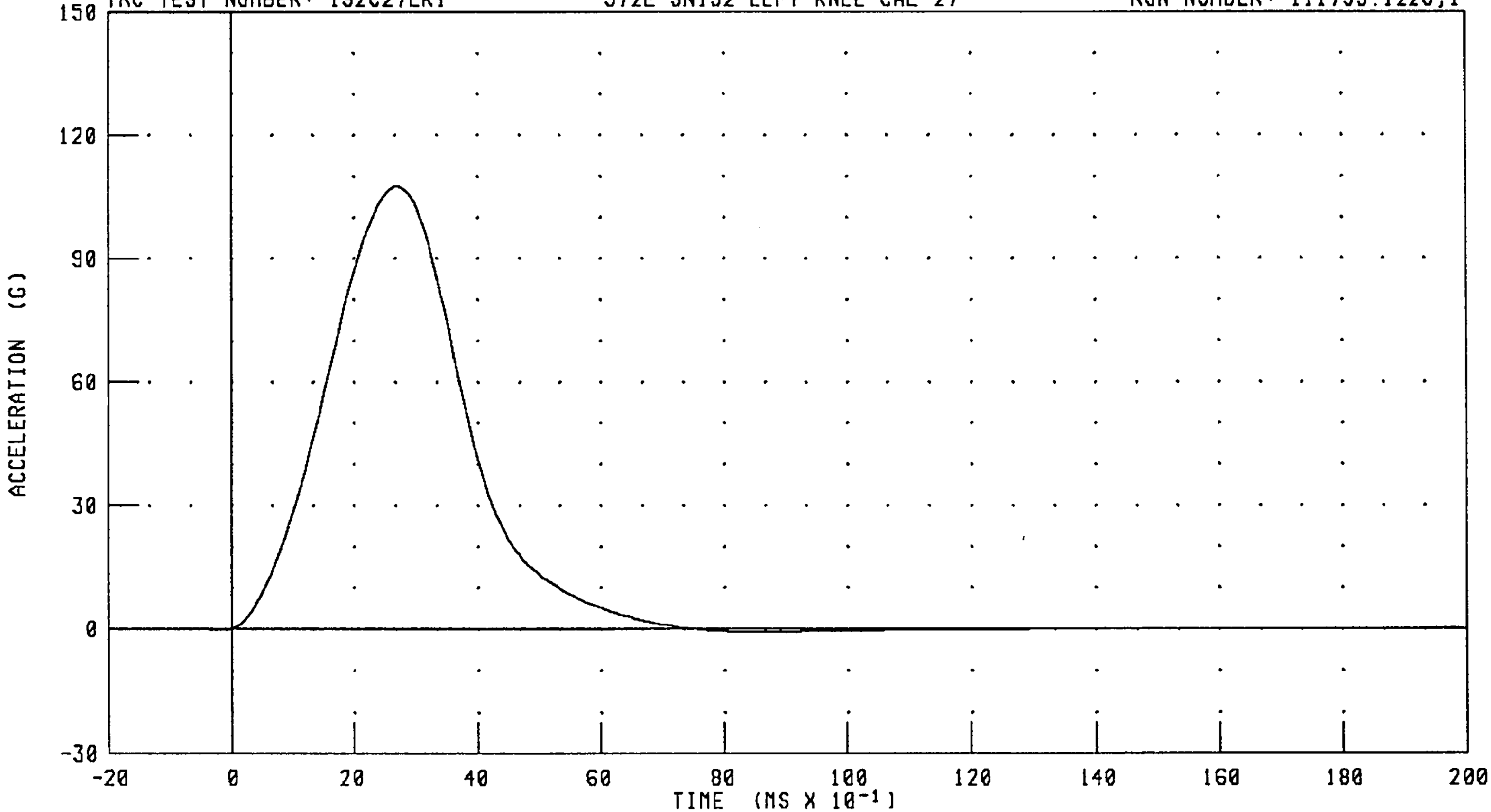
TEST MEETS SPECIFICATIONS

TECHNICIAN Cha. Middlet RUN NUMBER: 091395.1335;1

PART 572-E HYBRID III LEFT KNEE CALIBRATION

PENDULUM DECELERATION (5 KG PEND.)

TRC TEST NUMBER: 192C27LK1 572E SN192 LEFT KNEE CAL 27 RUN NUMBER: 111795.1228;1



CHANNEL: PENXG FILTER: CH. CLASS 600 PEAK DATA: 107.56 G @ 2.72 MS; -0.79 G @ 8.56 MS

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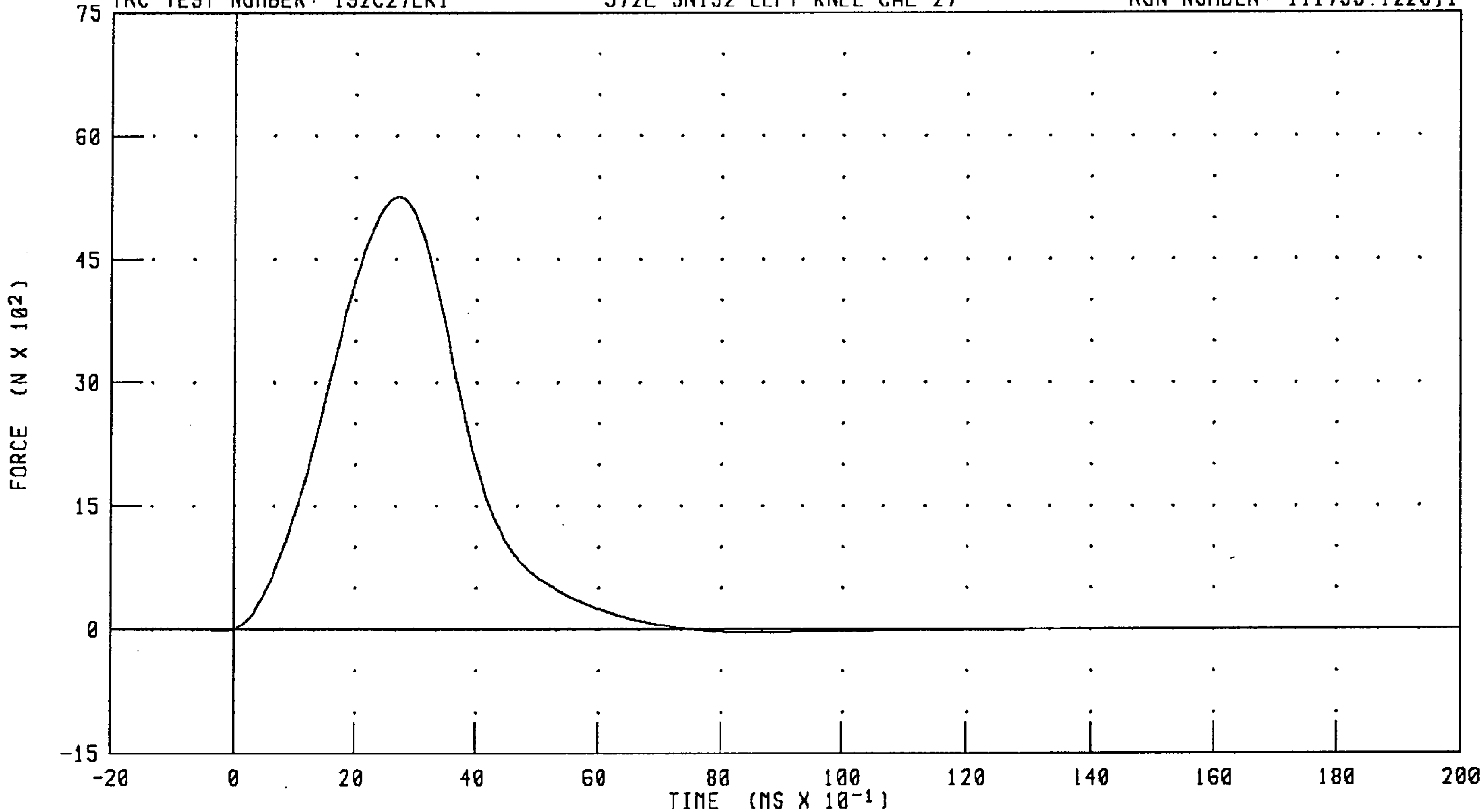
PART 572-E HYBRID III LEFT KNEE CALIBRATION
PENDULUM FORCE (5 KG PEND.)

TRC TEST NUMBER: 192C27LK1 572E SN192 LEFT KNEE CAL 27 RUN NUMBER: 111795.1228;1



CHANNEL: PENXF FILTER: CH. CLASS 600 PEAK DATA: 5262.53 N @ 2.72 MS; -38.88 N @ 8.56 MS

951101

Appendix D

Miscellaneous Test Information

Dummy Instrument Calibrations

Driver Dummy #142

	Serial Number	Model Number	Manufacturer	Calibration Date Last	Calibration Date Due
Head X-axis accelerometer	A74JJ	7264	Endevco	09/01/95	03/01/96
Head X-axis accelerometer-redundant	AC8L5	7264	Endevco	09/01/95	03/01/96
Head Y-axis accelerometer	ACCR7	7264	Endevco	09/01/95	03/01/96
Head Y-axis accelerometer-redundant	AC872	7264	Endevco	09/01/95	03/01/96
Head Z-axis accelerometer	ACCJ1	7264	Endevco	09/01/95	03/01/96
Head Z-axis accelerometer-redundant	A68JJ	7264	Endevco	09/01/95	03/01/96
Chest X-axis accelerometer	AC721	7264	Endevco	09/01/95	03/01/96
Chest X-axis accelerometer-redundant	A65JJ	7264	Endevco	09/01/95	03/01/96
Chest Y-axis accelerometer	CY47H	7264	Endevco	09/01/95	03/01/96
Chest Y-axis accelerometer-redundant	FH14J	7264	Endevco	09/01/95	03/01/96
Chest Z-axis accelerometer	AAL44	7264	Endevco	09/01/95	03/01/96
Chest Z-axis accelerometer-redundant	AC745	7264	Endevco	09/01/95	03/01/96
Left femur force load cell	903	2430	GSE	09/01/95	03/01/96
Right femur force load cell	904	2430	GSE	09/01/95	03/01/96
Neck X-axis force load cell[1]	280	1716	Denton	09/01/95	03/01/96
Neck Y-axis force load cell[1]	280	1716	Denton	09/01/95	03/01/96
Neck Z-axis force load cell[1]	280	1716	Denton	09/01/95	03/01/96
Neck Moment about X-axis load cell[1]	280	1716	Denton	09/01/95	03/01/96
Neck Moment about Y-axis load cell[1]	280	1716	Denton	09/01/95	03/01/96
Neck Moment about Z-axis load cell[1]	280	1716	Denton	09/01/95	03/01/96
Pelvis X-axis accelerometer	CY63H	7264	Endevco	09/01/95	03/01/96
Pelvis Y-axis accelerometer	AMWA9	7264	Endevco	09/01/95	03/01/96
Pelvis Z-axis accelerometer	ANA55	7264	Endevco	09/01/95	03/01/96
Chest deflection potentiometer[1]	142	14CB1-2981	Vernitech	09/01/95	03/01/96
Lap belt force load cell	234	3419	Lebow	07/14/95	01/14/96
Shoulder belt force load cell	236	3419	Lebow	07/14/95	01/14/96

[1] Hybrid III use only.

Dummy Instrument Calibrations

Right Front Passenger Dummy #192

	Serial Number	Model Number	Manufacturer	Calibration Date Last	Calibration Date Due
Head X-axis accelerometer	AAL82	7264	Endevco	08/30/95	03/01/96
Head X-axis accelerometer-redundant	AJ8J7	7264	Endevco	08/30/95	03/01/96
Head Y-axis accelerometer	A84JJ	7264	Endevco	08/30/95	03/01/96
Head Y-axis accelerometer-redundant	AJ8A6	7264	Endevco	08/30/95	03/01/96
Head Z-axis accelerometer	DW04J	7264	Endevco	08/30/95	03/01/96
Head Z-axis accelerometer-redundant	AC8W6	7264	Endevco	08/30/95	03/01/96
Chest X-axis accelerometer	CT22H	7264	Endevco	08/30/95	03/01/96
Chest X-axis accelerometer-redundant	A79GJ	7264	Endevco	08/30/95	03/01/96
Chest Y-axis accelerometer	AC708	7264	Endevco	08/30/95	03/01/96
Chest Y-axis accelerometer-redundant	AGR69	7264	Endevco	08/30/95	03/01/96
Chest Z-axis accelerometer	CW59H	7264	Endevco	08/30/95	03/01/96
Chest Z-axis accelerometer-redundant	DB74H	7264	Endevco	08/30/95	03/01/96
Left femur force load cell	986	2430	GSE	08/30/95	03/01/96
Right femur force load cell	987	2430	GSE	08/30/95	03/01/96
Neck X-axis force load cell[1]	85	1716	Denton	08/30/95	03/01/96
Neck Y-axis force load cell[1]	85	1716	Denton	08/30/95	03/01/96
Neck Z-axis force load cell[1]	85	1716	Denton	08/30/95	03/01/96
Neck Moment about X-axis load cell[1]	85	1716	Denton	08/30/95	03/01/96
Neck Moment about Y-axis load cell[1]	85	1716	Denton	08/30/95	03/01/96
Neck Moment about Z-axis load cell[1]	85	1716	Denton	08/30/95	03/01/96
Pelvis X-axis accelerometer	AJ694	7264	Endevco	08/30/95	03/01/96
Pelvis Y-axis accelerometer	AJ656	7264	Endevco	08/30/95	03/01/96
Pelvis Z-axis accelerometer	AJ788	7264	Endevco	08/30/95	03/01/96
Chest deflection potentiometer	87313-96	14CB1-2981	Vernitech	08/30/95	03/01/96
Lap belt force load cell	615	3419	Lebow	07/14/95	01/14/96
Shoulder belt force load cell	616	3419	Lebow	07/14/95	01/14/96

[1] Hybrid III use only.

Vehicle and Calibration Laboratory Instrument Calibrations

Vehicle Accelerometers

	Serial Number	Model Number	Manufacturer	Calibration Date Last	Calibration Date Due
Left rear seat crossmember X-axis	FH45J	7264	Endevco	09/27/95	03/27/96
Left rear seat crossmember X-axis redundant	DK71J	7264	Endevco	10/05/95	04/05/96
Right rear seat crossmember X-axis	CH86H	7264	Endevco	08/27/95	02/27/96
Right rear seat crossmember X-axis redundant	DK26JT	7264	Endevco	09/08/95	03/08/96
Engine top X-axis	DA99H	7264	Endevco	10/02/95	04/02/96
Engine bottom X-axis	CY26H	7264	Endevco	09/27/95	03/27/96
Right brake caliper X-axis	CK25H	7264	Endevco	09/14/95	03/14/96
Left brake caliper X-axis	ANA36	7264	Endevco	09/07/95	03/07/96
Instrument panel center X-axis	DY61J	7264	Endevco	07/14/95	01/14/96

Calibration Laboratory Instruments

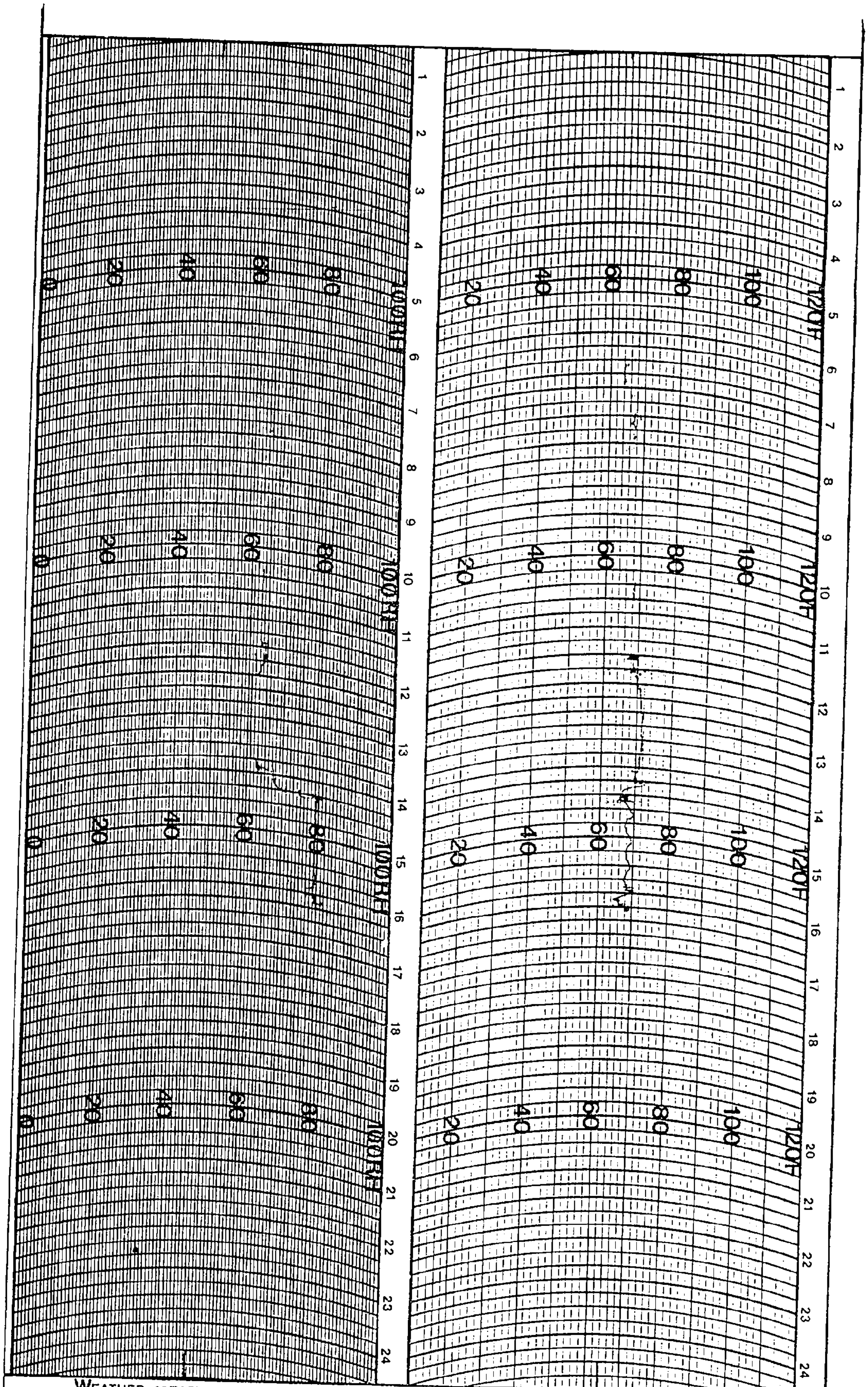
	Serial Number	Model Number	Manufacturer	Calibration Date Last	Calibration Date Due
Neck bending pendulum accelerometer	CB27	7232	Endevco	09/19/95	03/19/96
Neck bending rotary potentiometer	NA	35435-1-102	Bournes	Mfr. Specification	
Neck bending linear potentiometer	NA	5184-2051846003	Bournes	09/19/95	03/19/96
Thorax/Hybrid II femur pendulum accelerometer	CC64	7232	Endevco	09/19/95	03/19/96
Lumbar flexion force gauge	NA	DPPH-50	Chatillon	05/03/89	repaired
Lumbar flexion rotation gauge	CP17-0601-1	7020	Humphrey	Mfr. Specification	
Abdomen compression displacement gauge	4075-175	80294-2051941504	Bournes	09/19/95	03/19/96
Abdomen compression force gauge	3443	3167	Lebow	09/19/95	03/19/96
Hybrid III femur pendulum accelerometer	CG83	7232	Endevco	09/19/95	03/19/96

Sign Convention
NHTSA Data Tape Reference Guide

Accelerometers:	+X: Forward	
	+Y: Leftward	
	+Z: Upward	
Potentiometers:	+Chest longitudinal deflection:	Outward
	+Chest lateral deflection:	Leftward
	+Seat belt displacement:	Outward
	+Seat belt extension:	Elongation
	+Knee slider displacement:	Distance between femur and tibia increased (in relation to a seated dummy)
Load cells:	+Femur force:	Tension
	+Seat belt force:	Tension
	+Barrier force:	Tension
Neck load cells:	+X force:	Head pushed forward
	+y force:	Head pushed leftward
	+Z force:	Head pulled upward (tension on neck)
	+X moment:	Right ear rotating toward right shoulder
	+Y moment:	Chin rotating toward chest
	+Z moment:	Chin rotating toward left shoulder
Tibia load cells:	+X force:	Tension
	+Y force:	Tension
	+Z force:	Tension
	+X moment:	Bottom of tibia moving leftward
	+Y moment:	Bottom of tibia moving rearward

Frequency Response Classes
SAE J211 OCT88

Typical Test Measurements	Channel Class
Vehicle Structural Accelerations for use in:	
Total vehicle comparison	60
Collision simulation input	60
Component analysis	600
Integration for velocity or displacement	180
Barrier Face Forces	60
Belt Restraint System Loads	60
Anthropomorphic Test Device	
Head accelerations (linear and angular)	1000
Neck	
Forces	1000
Moments	600
Thorax	
Spine accelerations	180
Rib accelerations	1000
Sternum accelerations	1000
Deflections	180
Lumbar	
Forces	1000
Moments	1000
Pelvis	
Accelerations	1000
Forces	1000
Moments	1000
Femur/Knee/Tibia/Ankle	
Forces	600
Moments	600
Displacements	180
Sled Accelerations	60
Steering Column Loads	600
Head form Accelerations	1000



WEATHER MEASURE
P.O. BOX 41257
SACRAMENTO, CA. 95841
PHONE (916)481-7565

HYGROTHERMOGRAPH
1 DAY

CHART # C311 D HF
PART # 699123

STATION 951101 ______ DATE ON ______ DATE OFF ______

Appendix E

Restraint System Instructions from Owner's Manual

SAFETY BELTS

Always wear your safety belts!

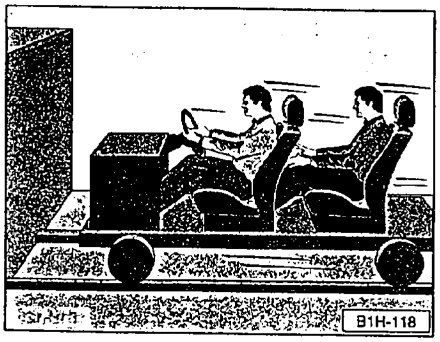
WARNING

Safety belts have been shown to be the single most effective means available for reducing the potential for serious injury and death in automobile accidents. Therefore, for your own protection as well as that of your passengers always properly wear safety belts when the vehicle is in motion.

Pregnant women, injured or physically impaired persons should also use safety belts. Like all vehicle occupants, they are more likely to be seriously injured if they do not wear safety belts. The best way to protect the fetus is to protect the mother.

Why safety belts work and how to wear them properly is explained in this chapter. Read all the information given and always observe the following instructions and warnings pertaining to the use of the safety belts installed in your vehicle.

For information on child safety see page 34.



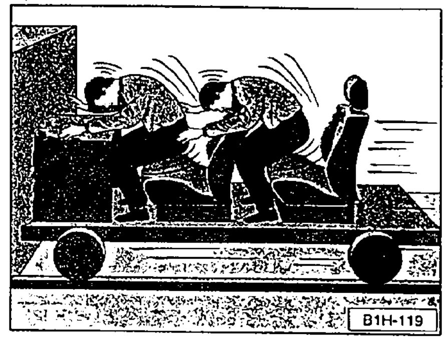
Why safety belts work

Safety belts can't work unless they are worn and worn properly.

The illustration above shows the passengers on a "vehicle" which is headed for a brick wall. They are not using safety belts.

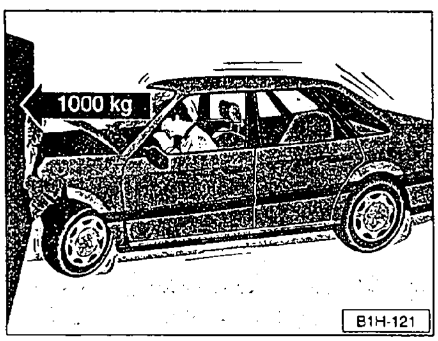
The physical principles involved are simple. Both the vehicle and the passengers possess energy which varies with vehicle speed and body weight. Engineers call this energy "kinetic energy".

The higher the speed of the vehicle and the greater the passenger's weight, the more kinetic energy there is and the more energy which must be "absorbed" in an accident.



Vehicle speed is, however, the most significant factor. If the speed doubles from 15 to 30 mph (25 to 50 km/h), for example, the kinetic energy increases 4 times!

Because these passengers are not using safety belts, their kinetic energy remains unchanged. They will keep moving at the same speed the vehicle was moving just before the crash, until something gets in the way – here, the wall.



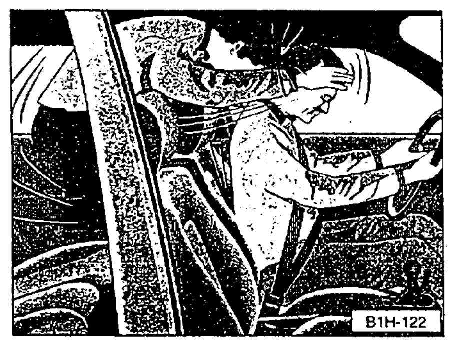
The same physical principles apply to people sitting in a passenger car which is involved in a frontal collision.

Even when driving at city speeds of 20 to 30 mph (30–50 km/h), the forces acting on the body can reach one ton (2000 lb/1000 kg) or more. At greater speeds these forces are even higher.

People who do not use safety belts are also not attached to their car. In a frontal collision they will also continue to move forward at the speed their car was travelling just before the impact.

Unable to resist the tremendous forces arising at impact, they will slam violently into the steering wheel, dashboard, windshield or whatever else is in the way. Their impact with the vehicle interior takes place with all of the kinetic energy they had just before their car crashed. Those who do not use safety belts can also be thrown out of their car where even more severe or fatal injuries can occur.

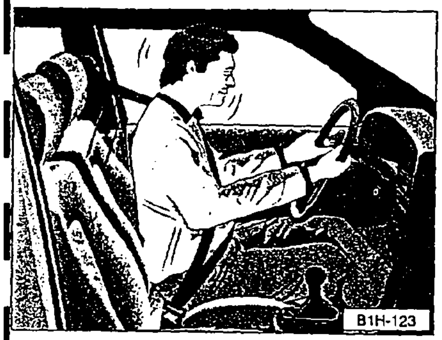
Nobody is strong enough to overcome the forces of an accident by holding tight or bracing themselves against the dashboard. Safety belts can help to reduce the risk of injury caused by uncontrolled impact with the vehicle and the possibility of ejection.



Passengers sitting in the rear seats who do not use safety belts endanger not only themselves but also front seat passengers. In a frontal collision they will also move forward where they can hit and injure the driver or front seat passenger.

Safety belts protect

Safety belts used properly can make a big difference. Safety belts help to keep passengers in their seats, reduce energy levels applied to the body in an accident gradually and help prevent the uncontrolled movement which can cause serious injuries. Safety belts also help to keep passengers in their seats.



Safety belts attach passengers to the car and give them the benefit of being slowed down more gently or "softly" through the give in the safety belts, crumple zones and other safety features engineered into today's cars. By reducing the kinetic energy over a longer period of time, the forces on the body become more "tolerable" and less likely to produce injury.

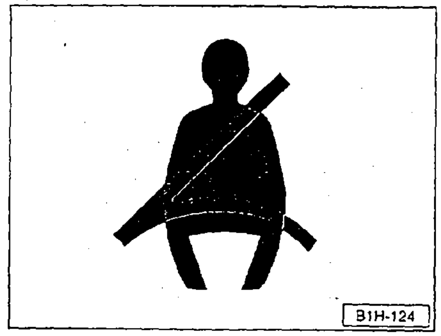
In addition, safety belts reduce the danger of being thrown out of the car.

Although these examples are based on a frontal collision, safety belts can also substantially reduce the risk of injury in other types of accidents. So, regardless of whether you are on a long trip or just going to the corner store, always buckle up and make sure others do too.

The following pages provide important instructions which will enable you to use safety belts properly. Be sure to read and follow the instructions carefully and heed all warnings.

To further increase the safety for the front passengers, the vehicle is equipped with a supplemental air bag system. See page 29.

The safety belts provided must nevertheless be worn because the air bags are activated only by severe frontal collisions. The air bags are not activated by minor frontal collisions, side and rear collisions, by a roll over or by cases where there is no considerable impact on the front of the vehicle.



Belt warning system

Your vehicle has a warning light to remind you to wear your safety belt.

If you do not put on your safety belt after switching on the ignition, the warning light in the instrument cluster will come on along with a chime for approximately 6 seconds.

Fasten your safety belt now and make sure that your passengers also properly put on their safety belts.

How to wear safety belts properly

On the previous pages, you have seen how safety belts offer protection in accidents. Accident statistics show that passengers properly wearing safety belts have a lower risk of being injured and a much better chance of surviving an accident. For this reason, wearing a safety belt is legally required in most countries and in much of the United States and Canada.

WARNING

Always fasten your safety belts before driving off. Always make sure your passengers are properly restrained – even those sitting in the rear.

Safety belts can only work when used properly. Always observe the following precautions:

- **Never wear belts twisted.**
- **Never strap in more than one person, including small children, with each belt. It is especially dangerous to place a safety belt over a child sitting on your lap.**

- **Never place your feet on the instrument panel or on the seat. Always keep both feet on the floor in front of the seat.**
- **Never wear belts over rigid or breakable objects in or on your clothing, such as eye glasses, pens, keys, etc. as these may cause injury.**
- **Never wear safety belts in any other way than illustrated and described in this chapter. For instance, do not wear shoulder part of belt under your arm or otherwise out of position. This would increase the risk of serious injury in case of an accident.**
- **Several layers of heavy clothing may interfere with proper positioning of belts and reduce the overall effectiveness of the system.**
- **Never allow safety belts to become damaged by being caught in door or seat hardware. Always keep belt buckles free of any obstruction that may prevent secure locking.**
- **Never use comfort clips or devices which create slack in the shoulder belt portion and can increase the risk of injury in an accident. However, such clips may be required in the proper use of some child restraint systems.**

- **Inspect your belts periodically. If belts show damage to webbing, bindings, buckles or retractors, they must be replaced.**
- **The belts must be kept clean as otherwise the retractors may not work properly (see also "Vehicle Care").**
- **Safety belts that have been worn and loaded in an accident must be replaced by an authorized Audi dealer.**
- **Never modify, disassemble or attempt to repair the safety belts in your vehicle.**

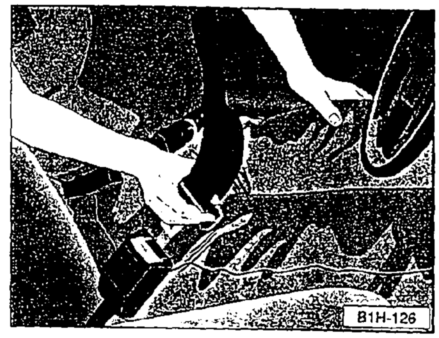
Your Audi has 5 seating positions. Two in the front and three in the rear. Each seating position has been provided with a safety belt, which must be used in the interests of safety whenever the vehicle is in motion.

Lap-shoulder belt

The front and rear seats are equipped with three-point safety belts.

The combination lap-shoulder belts have locking retractors. The system adjusts automatically to your size and movements as long as the pull on the belt is slow.

Hard braking or a collision locks the belt. The belt will also lock when you drive up or down a steep hill or in a sharp curve.



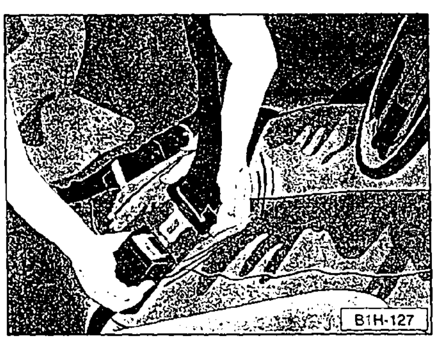
Fastening the safety belt

- **Before fastening the safety belt, first adjust your seat – see page 41.**

WARNING

Safety belts only offer optimum protection when the seat back is upright and belts are properly positioned on the body. Improperly positioned safety belts can cause serious personal injury in an accident.

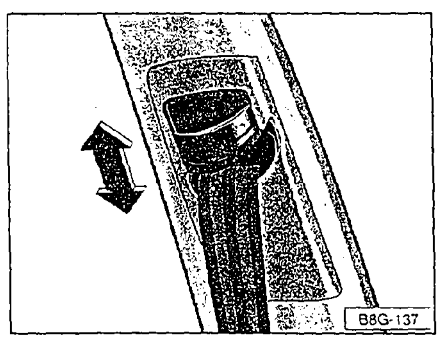
- To fasten, grasp belt tongue and pull belt in continuous slow motion across your chest and lap.



- Insert belt tongue into buckle on inboard side of seat. Push down until it is securely locked with an audible click. Pull belt to check.

WARNING

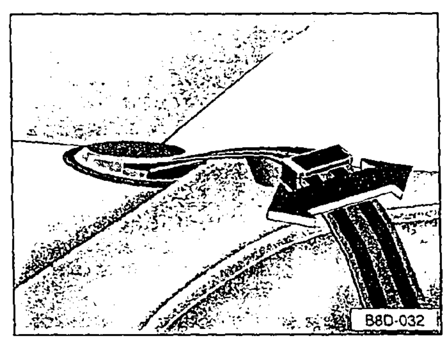
Always make certain that the safety belt tongue is inserted into the safety belt buckle associated with the corresponding seat. Attaching the safety belt to the buckle for another seat could reduce safety belt effectiveness and cause injury.



Adjusting shoulder seat belt

Safety belt height adjustors on the **front seats** can be used to adjust the height of the shoulder portion of the safety belt.

- Press the handle slowly up or down so that the shoulder portion of the safety belt is positioned nearly midway over the shoulder.
- Pull on the shoulder belt to check whether the belt anchor is securely locked in place.

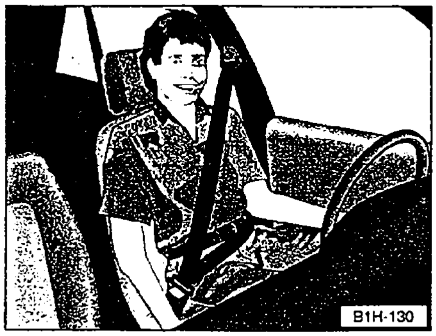


The **outer rear seats** are equipped with a **lateral shoulder belt adjustment.**

To adjust, move the belt guide towards the center of the vehicle for taller occupants, or towards the outside for shorter occupants. See symbols on the belt guide.

Note

Wearing your safety belt properly – see page 22.



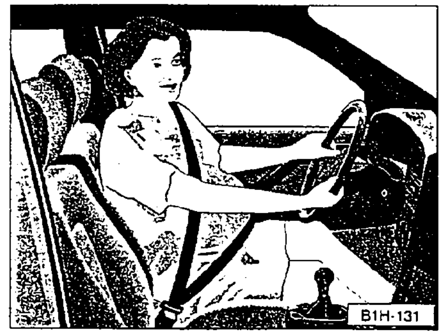
The shoulder belt must be positioned over the shoulder – **it must never rest against the neck and must fit against your body**. See illustration.

The lap belt must be worn low and tight across the pelvis. Pull belt tight if necessary.

WARNING

■ **Always position safety belts properly over the body for maximum levels of safety. Improperly positioned safety belts can cause serious personal injury in case of an accident.**

■ **Safety belts worn too loose will allow too much forward movement of your body in a crash. This will increase the risk of personal injury.**



WARNING

Pregnant women should especially make sure to wear the lap portion of the safety belt as low as possible across the pelvis so that there is no pressure on the abdomen.

Automatic Locking Retractor (ALR)

The automatic locking retractor is necessary to secure child restraint systems.

The retractors for the front passenger's seat and the rear seat three-point safety belts are equipped with an automatic locking feature in addition to the emergency locking feature.

If you need to install a child restraint system at the front passenger's seat or an outer seating position of the rear seat, it must be secured by use of the belt after activating the automatic locking feature – see page 39.

Activating the locking retractor

■ Slowly pull the belt all the way out.

■ Insert the belt tongue into the buckle for that seating position (pull on it to check!) and guide the rest of the belt with your hand back in place; while doing this you should hear an audible sound. This sound signals that the locking retractor has been activated.

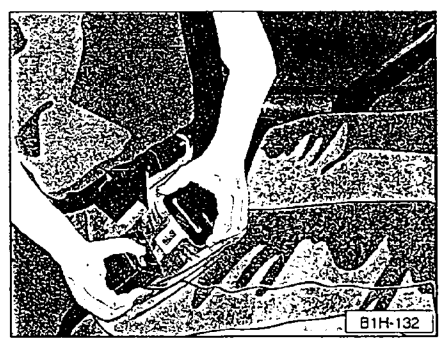
Deactivating the locking retractor

The locking retractor is deactivated by unfastening the safety belt and allowing the safety belt to retract completely to its stowed position. The safety belt can now be used as an ordinary three-point safety belt without the additional locking feature.

If a person sitting in the passenger's seat or rear wearing the safety belt should activate the locking retractor, then the safety belt must be unfastened in order to deactivate the locking retractor.

WARNING

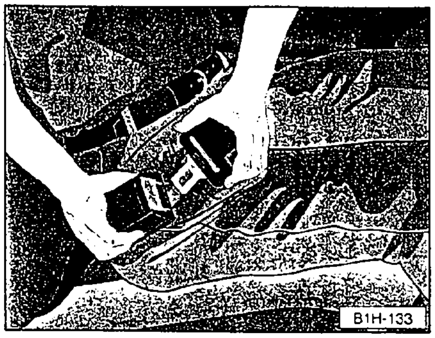
Never unfasten the safety belt to deactivate the locking retractor while the vehicle is in motion.



Unfastening the safety belt

■ Push the red release button on the buckle. The belt tongue will spring out of the buckle.

■ Allow belt to wind up on retractor as you guide belt tongue to its stowed position.



Lap belt

The rear center seating position is equipped with a lap belt.

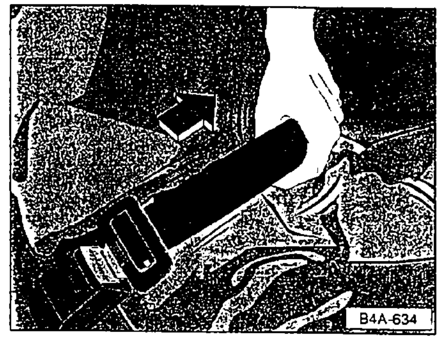
The belt incorporates an automatic retractor. The retractor will lock the lap belt when your passenger has buckled up, and the remaining slack has been retracted.

■ To fasten lap belt, grasp belt tongue and slowly and evenly pull across the pelvis. Insert belt tongue into the respective buckle and push down until it is securely locked with an audible click. Pull belt to check and make sure that any slack is wound on the retractor.

Note

If the belt locks up while pulling it out of the retractor, let the belt rewind **completely** and then pull it out again.

■ Then, make sure the belt is positioned low and tightly across the pelvis. If necessary, pull the belt toward the retractor and let it roll up.



WARNING

To reduce the risk of injury in an accident, position the lap belt tight and as low as possible across the pelvis.

Pregnant women should especially make sure to wear the lap portion of the safety belt as low as possible across the pelvis so that there is no pressure on the abdomen.

■ To unfasten belt, push in the red release button on buckle and let the belt roll up.

Belt tensioner

The safety of the driver and front passenger **wearing their safety belts** has been increased not only by the air bag system but also by a special safety belt retractor for the three-point automatic safety belts.

The system is activated by sensors of the air bag system in the case of a serious front collision. A fine dust will be released from each belt tensioner. The safety belts will automatically be tensioned.

The belt tensioner will not activate in the event of light frontal, side or rear collisions.

Notes

■ Due to special repair procedures, any work on the system, as well as the removal and installation of any components of the system, must be performed by an authorized Audi dealer only.

■ When the safety belt tensioner is activated, a fine dust is released. This is normal and is not caused by a fire in the vehicle.

■ The belt tensioner system works for **one** accident only. If the belt tensioners have been activated, then the system must be replaced.

■ Observe all safety regulations if the vehicle or individual parts of the system are to be scrapped. Your authorized Audi dealers are familiar with theses regulations and can perform this service for you.

■ **If you should sell your vehicle, be sure to give the purchaser this Owner's Manual.**

AIR BAG SYSTEM

Your vehicle is equipped with two air bags, one for the driver and the other for the front passenger.

The word "AIRBAG" is stamped into the covers on the steering wheel and the instrument panel above the glove compartment.

The air bags are intended to supplement the three-point safety belts. When the safety belts are properly worn, the supplemental air bag restraints can provide additional protection for the chest and face of the driver and the front seat passenger in the event of a severe frontal collision.

Aside from providing proven safety benefits, the safety belts are particularly important to help keep front seat occupants in the proper seated position so that the air bag can unfold properly and provide added protection as intended.

It is very important to remember that the supplemental air bag systems are not intended to provide this added protection in side impacts, rear impacts, roll-over accidents, or in less severe frontal impacts. **Therefore always wear your safety belts.** See pages 19 to 28.

The air bag system consists of the following components:

- an electronic control/monitoring unit,
- an inflatable air bag equipped with a gas generator located inside the steering wheel
- an inflatable air bag with two gas generators inside the instrument panel above the glove compartment for the front passenger,
- an indicator light in the instrument cluster (see page 68).

In addition to this your vehicle is also equipped with a kneebar for extra protection.

The indicator light in the instrument cluster (readiness light) will light up for a few seconds each time the ignition is switched on.

The light monitors the electric control/monitoring unit, ignitor sensor circuits, and system wiring.

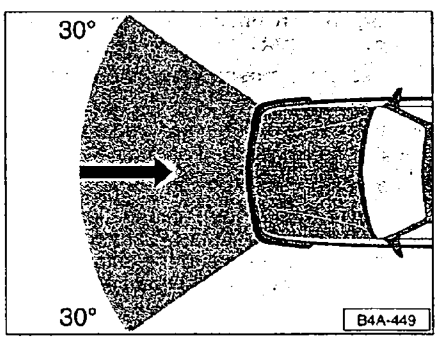
The system must be inspected if the indicator light:

- does not come on when the ignition is switched on;
- does not go out after a few seconds after the ignition is switched on, or;
- comes on while driving.

In the event of a system malfunction, the indicator light will first start flashing to catch the driver's attention and then stay on continuously to serve as a constant reminder to have the system repaired.

WARNING

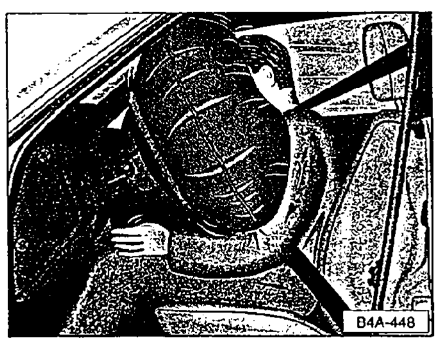
If any of these conditions occur, have the system inspected immediately by your Audi dealer. Otherwise, the air bag may not function properly.



How the air bag system works

Both air bags inflate only in a severe frontal collision occurring within the area indicated in the illustration. The air bags will not inflate in minor frontal collisions, side or rear collisions, in a rollover or in cases where there is no considerable impact to the front of the vehicle.

When the system is activated, the air bag fills with a propellant gas, breaks open the padded cover and inflates between the driver and steering wheel, as well as between the front passenger and instrument panel.



Fully inflated air bags in combination with properly worn safety belts slow down and limit the occupant's forward movement and help to reduce the risk of injury to the head and upper torso. See illustration.

Openings in the air bags then allow the gas to escape quickly.. The air bags will deflate sufficiently, enabling the front occupants to see forward once the impact has been absorbed.

When the air bag system is activated, fine dust is released. This is normal and is not caused by a fire in the vehicle.

This dust is mostly made up of a powder used to lubricate the air bags as they deploy and could irritate the skin.

WARNING

If you have been in an accident in which the air bags have deployed, be sure to wash your hands and face with mild soap and water before eating. Be careful not to get the dust into your eyes or into any cuts or scratches. If the residue should get into your eyes, flush them with water.

Always heed WARNINGS on next page.

Importance of proper seating position

WARNING

In order to help the air bag to do its job, it is important, both as a driver and as a passenger to maintain a proper seating position - see page 41.

In a frontal collision air bags must inflate within a fraction of a second and with a considerable amount of force in order to provide additional protection for the driver and front seat passenger. Do not sit any closer than necessary to the steering wheel and instrument panel. By keeping room between your body and the front of the passenger compartment, the air bag can inflate fully and completely as intended and do its job more effectively.

Be sure to always

- Adjust the driver's seat properly, consistent with your size. See also page 41.
- Make sure that the passenger's seat is no closer than necessary to the instrument panel.
- Maintain an upright seating position with your back against the backrest of your seat.

WARNING

- **Sitting too close to the steering wheel or dashboard will decrease the effectiveness of the air bags and can increase the risk of personal injury in an accident. Always wear safety belts properly and sit upright with the seat no closer to the steering wheel or instrument panel than necessary. If you are unrestrained, leaning forward, sitting sideways or out of position in any way, you are at greater risk of injury in a crash and may also receive serious injuries from the air bag if you are up against it when it inflates.**
- **Objects between you and the air bag can increase the risk of injury in an accident by interfering with the way the air bag unfolds or by being pushed into you as the air bag inflates. Never place objects over or near the area identifying the air bag by the word "Airbag"on the steering wheel and the instrument panel or between the area where the air bag is stored and yourself. These objects could cause injury especially in a crash severe enough to cause the air bag to inflate.**

  Never hold objects in your hands or on your lap when the vehicle is in use.
- **Never let children ride unrestrained in the vehicle.**

  Children may be severely injured or killed when the air bag inflates if they are not properly restrained.

Use of child restraints on the front seat

A child seat or infant carrier installed on the front seat may be struck and knocked out of position by the rapidly inflating passenger's air bag in a frontal collision. The air bag could greatly reduce the effectiveness of the child restraint and even injure the child during inflation.

For this reason and because children are generally better protected – when properly restrained for their age and size – in a rear seating position, we strongly recommend that children always sit in the back seat. See "Child Safety" on page 34.

If exceptional circumstances require the use of a child seat on the front seat, the child's safety and well-being require that the following precautions be taken:

WARNING

- **Never install rearward facing child seats or infant carriers on the front passenger seat. A child can be seriously injured when the passenger air bag inflates and forces the child seat or carrier and child against the backrest, center arm rest or door. Always install rearward facing child seats or infant carriers on the rear seat.**
- **Forward facing child seats or infant carriers installed on the front passenger's seat may interfere with the deployment of the air bag and cause serious injury to the child. Always install forward facing child seats and infant carriers on the rear seat.**

  If you must install a forward facing child restraint on the front passenger's seat in exceptional circumstances,
  - **always make sure that the forward facing child seat has been designed and certified by its manufacturer for use on the front seat of a vehicle which is equipped with a passenger side air bag.**
  - **always make sure that the passenger seat is adjusted as far to the rear as possible for the maximum possible distance between the instrument panel and the child. The backrest must remain in an upright position.**
- **Always follow the manufacturer's instructions provided with the child seat or carrier. For further details on the use of child restraints in your Audi, see page 34.**

Care, Service and Disposal

There are some general requirements for air bags which must be observed to make sure that the effectiveness of the system will not be impaired and the components which have been discarded do not cause injury or pollute the environment.

WARNING

- **Do not cover, obstruct or change the steering wheel horn pad or instrument panel in any way. Such action could adversely affect the performance of the air bag and increase the risk of injury.**

Always heed WARNINGS on next page.

■ For cleaning the horn pad or instrument panel, use only a soft, dry cloth or one which has been moistened with plain water. Solvents or cleaners could adversely affect the air bag cover and proper deployment of the system.

■ Do not make any repairs, adjustments or modifications to the air bag system.

■ Do not modify the front bumper or vehicle body structure. Such actions could adversely affect the performance of the air bag, bring about an inadvertent deployment, thereby increasing the risk of personal injury.

■ The air bag system must be replaced by your Audi dealer no later than 15 years after the date of manufacture.

■ The replacement date is found on the label on the door jamb on the driver's side. It is absolutely essential to observe this date in order to assure that the system is in good working order.

■ If components of the air bag system must be discarded, or if the vehicle must be scrapped, certain safety precautions must be observed. Your Audi dealer knows these precautions and can give you the necessary information. Failure to follow these precautions and procedures could increase the risk of personal injury.

■ Any work on the air bag system, such as removing/installing, repairing, or any work on the steering wheel must be performed by a qualified technician who has the training and special equipment necessary. Improper handling of the air bag system may result in serious personal injury. For any work on the air bag system, we strongly recommend that you see your Audi dealer.

■ The air bag system can only be activated once. After it has been used, it must be replaced.

■ If you sell your vehicle, be sure to inform the new owner of these important points and make certain that this manual is transferred to the new owner together with the vehicle.

CHILD SAFETY

The physical principles illustrated on pages 19 – 21 also apply to children. In contrast to adults and teenagers, their muscles and bones are not fully developed. In many respects children have a greater risk of serious injury in accidents than adults.

Because children's bodies are not fully developed, they require restraint systems which are especially designed for their size, weight and body structure. Many countries and all States of the United States have laws which require the use of approved child restraint systems for infants and small children.

Child restraints, like adult safety belts, must be used properly to be effective. Used improperly child restraints can also increase the risk of serious injury in an accident.

WARNING

■ Accident statistics have shown that children are generally safer in the rear seat area than in the front seating position.

■ All vehicle occupants and especially children should be restrained whenever riding in a vehicle. An unrestrained child could be injured by striking the interior, or by being ejected from the vehicle during a sudden maneuver or impact.

Do not allow a child to stand or kneel on the seat. If a child is leaning forward, sitting sideways or is out of position in any way, the child not only can be injured in a crash but will also receive serious injuries from the air bag when it inflates.

A child restraint system can help protect a child in a vehicle.

■ A suitable child restraint properly installed and used at one of the rear seating positions provides the highest degree of protection for infants and small children in most accident situations.

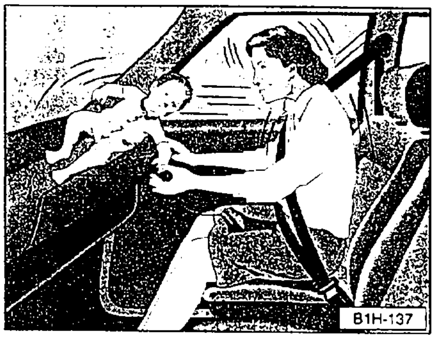
■ Children who are less than 12 years old should normally sit in the rear.

■ All children must use, depending on age and body size, either a child restraint system or the existing safety belts.

■ Never install rearward facing child seats or infant carriers on the front passenger seat. Use of a rearward facing child seat on front passenger seat will lead to serious injury when air bag inflates. When using a forward facing child seat on front seat, always make sure that passenger seat is in rearmost position.

■ Forward facing child seats or infant carriers installed on the front passenger's seat may interfere with the deployment of the air bag and cause serious injury to the child. Always install forward facing child seats and infant carriers on the rear seat.

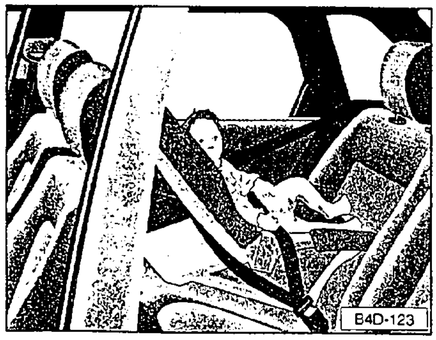
If you must install a forward facing child restraint on the front passenger's seat in exceptional circumstances, always make sure that the forward facing child seat has been designed and certified by its manufacturer for use on the front seat of a vehicle which is equipped with a passenger side air bag.



In a frontal accident at a speed of 20 - 35 mph (30 - 56 km/h) the forces acting on a 13 lb (6 kg) infant would be more than twenty times the weight of the child. This means that the weight of the child would suddenly be more than 260 lbs (120 kg). Only an appropriate child restraint system properly used can reduce the risk of serious injury under these conditions.

WARNING

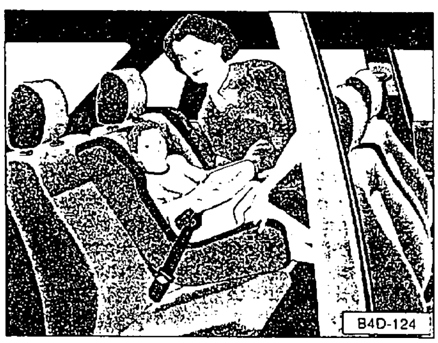
Infants and older children must never ride in a vehicle sitting on the lap of an adult. Holding a child in your arms is never a substitute for a child restraint system and could cause serious injury to the child.



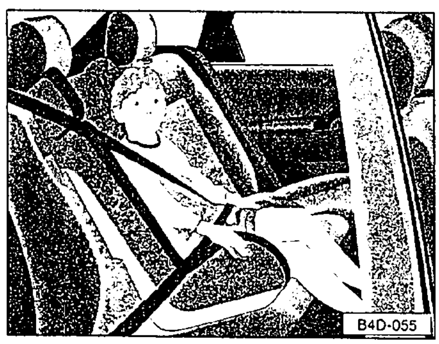
Forces acting on a child in an accident make it impossible to hold a child in the arms. The child would hit the dashboard, windshield or other parts of the vehicle interior, or be struck with a great force by the passenger's air bag as it deploys and could receive serious injury. The adult's body could also move forward, particularly if the adult is not using safety belts and cause additional injury to the child.

WARNING

- **A suitable child restraint properly installed and used at one of the rear seating positions provides the highest degree of protection for infants and small children in most accident situations.**
- **Infants up to approximately 9 months old (22 lbs/10 kg) receive the best protection in special infant carriers and child seats designed for their age group. Many experts believe that infants and small children should only ride in special child restraints in which the child's back faces in driving direction.**



Babies and small children up to approximately 4 years old (40 lbs/18 kg) should be restrained in child seats with a front safety "shield", or should sit in a rear-facing child safety restraint system.



Children up to 7 years old (55 lbs/25 kg) are best protected in child safety seats designed for their age and weight. Experts say that the skeletal structure, particularly the pelvis, of these children is not fully developed and that they should not use lap belts.

WARNING

Always make sure that the shoulder portion of the three point belt is positioned midway over the shoulder of the child. The shoulder portion must never rest against or across the neck and it may never contact or remain in front of the face, chin or throat. The lap belt portion of the three point belt as well as any lap belt alone must always pass as low as possible across the pelvis, never over the abdomen.

Always heed WARNINGS on next page.

Children of average size of about 7 years and older may use available three point combination lap and shoulder belts usually together with appropriate booster seats meeting all applicable safety standards. Booster seats raise the seating position of the child and reposition both the lap and shoulder portions of the safety belt so that they pass across the child's body in the right places.

The routing of the belt over the child's body is extremely important for the child's protection whether or not a booster seat is used.

WARNING

Always make sure that the shoulder portion of the three point belt is positioned midway over the shoulder. The shoulder portion must never rest against or across the neck and it may never contact or remain in front of the face, chin or throat. The lap belt portion of the three point belt as well as any lap belt alone must always pass as low as possible across the pelvis, never over the abdomen.

Children of average size of about 7 years of age and older may use available lap belts in exceptional circumstances if the proper use of three point belts alone is not possible. Always remember that children do not have the pronounced pelvic structure required for the proper function of lap belts and that the child's safety absolutely requires that the lap belt be fastened snugly and as low as possible around the pelvis. The lap belt must never pass over the stomach or abdomen.

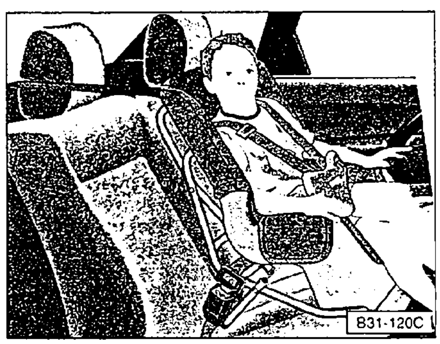
Younger children should only use a lap belt in very exceptional situations and only if no child restraint system for the child's size and weight or safer alternative means of transportation of the child is available. The use of a lap belt in these exceptional situations is better than permitting the child to remain totally unrestrained. A lap belt cannot provide the same level of protection as a proper child restraint. The use of a lap belt for younger children may violate laws in your state or province.

WARNING

- **An improperly worn safety belt will not provide optimum protection in an accident and may cause serious personal injury. Always make sure that children and other vehicle occupants properly wear available restraint systems. Carefully follow the instructions provided by the manufacturers of child restraints.**
- **Commercially available child seats are required to comply with U.S. Federal Motor Vehicle Safety Standard (FMVSS) 213 (or in Canada CMVSS 213).**

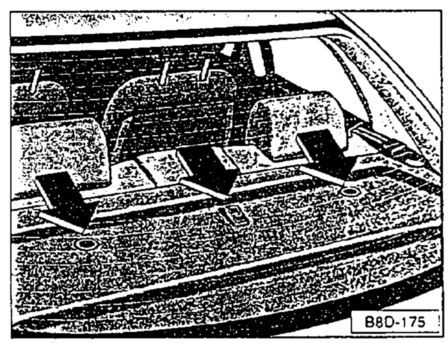
These standards include installation requirements which utilize a lap belt or the lap portion of a combination lap-shoulder belt such as that installed in your vehicle.

- **When purchasing a child restraint, select one which fits your child and vehicle.**
- **Only use child restraint systems which fully contact the flat portion of the seat cushion. The child seat must not tip or lean to either side. We do not recommend the use of child seats which rest on legs or tube-like frames because they do not provide adequate contact with the seat.**
- **Improperly or inadequately installed child restraint systems can increase the risk of injury to children in accidents. Therefore always carefully read and follow all instructions on installation and use that come with the system.**



Child restraint anchorages for the rear seats (Canada models)

If your child restraint seat or seats are equipped with a tether strap you will want to use one or more of the three anchor points provided on the filler panel behind the rear seat.



The three restraint anchorage points are shown in the illustration (see arrows).

The center anchor point comes with the hardware needed to attach the tether strap. The other two anchor points have been covered with plastic caps. The hardware can be moved to one of the other anchor points if required.

If more than one child restraint system is to be used at the same time, the necessary upper anchorage fitting must first be mounted on the respective anchorage point.

The hexagonal head bolts, spacers and fittings are available from Audi dealers.

Always heed WARNING on next page.

WARNING

■ Never use child restraint anchorages to secure safety belts of any kind.

■ The child restraint anchorages are only to be used to hold a child restraint system in its place.

■ Child restraint anchorages are designed to withstand only those loads imposed by correctly fitted child restraints. Under no circumstances are they to be used for adult seat belts or harnesses.

■ Do not mount two child restraint seats on one anchor point.

■ Always follow the instructions provided by the manufacturer of the child restraint which you intend to install in your Audi.

Child restraint anchorages (USA models)

Your vehicle can be fitted with anchorage points for use with certain types of child restraints requiring a tether strap.

Ask your authorized Audi dealer for installation of one or more anchor points and the required hardware for the attachment of the tether.

Automatic Locking Retractor

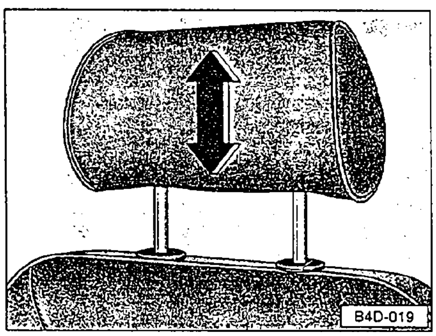
The three-point safety belts for the front passenger's seat and the outer rear seats are equipped with an additional Automatic Locking Retractor.

To activate the locking retractor slowly pull the belt all the way out – see also page 26.

A child restraint system to be placed on the front passenger's seat or on either of the outer seating positions of the rear seat must be secured with a safety belt according to the manufacturer's instructions.

Insert the belt tongue into the buckle for that seating position and guide the rest of the belt with your hand back in place; while doing this you should hear an audible sound. This sound signals that the locking retractor has been activated. After that, pull on the belt to make sure the restraint system is secured.

HEAD RESTRAINTS



The padded head restraints on the front and rear seats are adjustable.

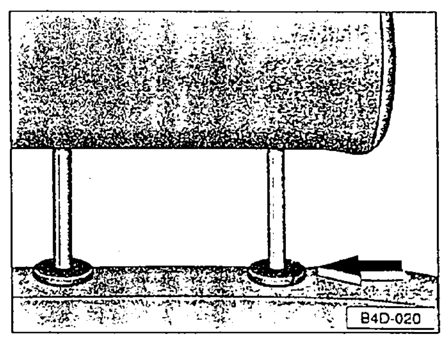
Position the head restraints according to the occupant's height. Properly positioned head restraints, together with the use of safety belts offer effective protection in most accident situations.

■ For height adjustment, grasp firmly with both hands and pull up or push down.

■ For maximum protection, the upper edge should be at eye level.

WARNING

Do not drive the vehicle without the head restraints provided. Head restraints are designed to help reduce injuries.



Removing and installing head restraints

To **remove** the head restraint, pull the head restraint upward until it stops. Then press the button (arrow) on the left rod and simultaneously pull out the head restraint.

To **reinstall,** push the two rods of the headrest into the guides until you hear them lock into place.

SEATS

The correct positioning of the seats is important:

- so that you can reach all the controls on the vehicle quickly and safely;
- so that you can drive or ride relaxed and help reduce fatigue;
- **and for maximum protection offered by the safety belts and air bag system.**

Therefore, always adjust the position of the seat as described in points 1 to 4 on the following pages. Remember to adjust the seats before fastening the safety belts and before driving off. Always be sure to follow these general guidelines:

Driver's seat

To avoid contact with the air bag while it is unfolding, the driver must not sit any closer to the steering wheel than necessary and always properly wear available three point belts.

We recommend that you adjust the driver's seat as follows:

- Adjust the seat in the fore and aft direction so that you can easily push the pedals all the way while keeping your knee slightly bent.
- Adjust the seatback so that when you sit with your back against the seatback, you can still grasp the top of the steering wheel with your elbows slightly bent.

Front passenger's seat

To avoid contact with the air bag while it is unfolding, the adult front seat passenger must not sit any closer to the instrument panel than necessary and always properly wear available three point belts.

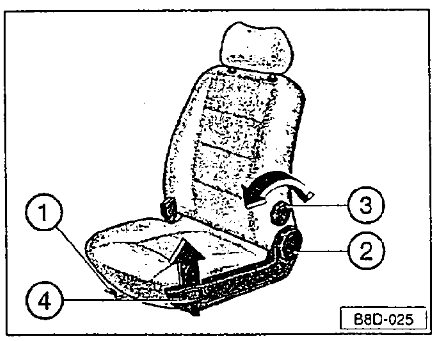
We recommend that you adjust the passenger's seat as follows:

- backrest upright (**not** reclined)
- feet comfortably on the angled floor (foot rest) in front of the passenger's seat
- with the feet as described above, adjust seat as far as possible to the rear of the fore and aft adjustment range.

For information on transporting children on the front passenger seat see page 34.

WARNING

- **Do not adjust seats while the vehicle is in motion. Your seat may move unexpectedly causing sudden loss of vehicle control or personal injury.**
- **To reduce the risk of serious personal injury in an accident, front seat passengers must never ride in a moving vehicle with the seatback reclined. The risk of personal injury increases with increasing rearward angle of the seatback. Safety belts only offer protection when the seatback is upright and belts are properly positioned on the body. Improperly positioned safety belts can cause serious personal injury in an accident.**
- **For driver's and passenger's protection, make sure front seats and seatbacks are securely latched in place.**
- **Never store items under the seats. Loose objects can interfere with the seat latching mechanism and can also cause injury in an accident.**



Manually adjustable seats*

1 – Forward and backward adjustment

- Pull handle in front of seat.
- Slide seat into position.
- Release the handle and move seat slightly back and forth to make sure it is securely locked into position.

2 – Seatback adjustment

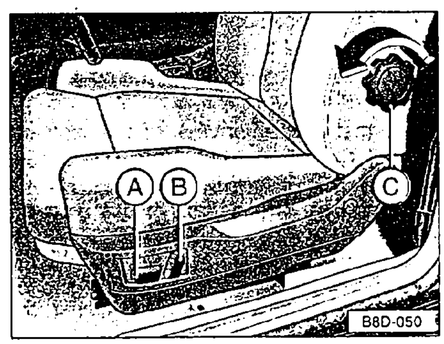
Turn wheel on outboard side of seat cushion, with your body weight taken off the seatback.

3 – Lumbar support adjustment*

Adjust the backrest support by turning the adjuster knob in the backrest adjuster wheel. This gives more support to the natural curvature of your spine and will reduce fatigue especially during longer trips.

4 – Height adjustment

- Shift your body weight forward and pull lever upwards.
- Raise or lower the seat by shifting your weight upward or downward.
- Release the lever to lock the seat at the desired height.



Electrically adjustable seats*

The front seat adjustment control switches A and B are located on the outboard side of each seat. The controls also work with the ignition off.

The adjuster wheel C can be used to adjust the **lumbar support*** mechanically:

Adjust the backrest support by turning the adjuster wheel in the backrest. This will give you more or less support for the natural curve of your lower back to minimize fatigue, especially during long trips.